

The Iron Age

A Review of the Hardware and Metal Trades.

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The Vienna Exposition.

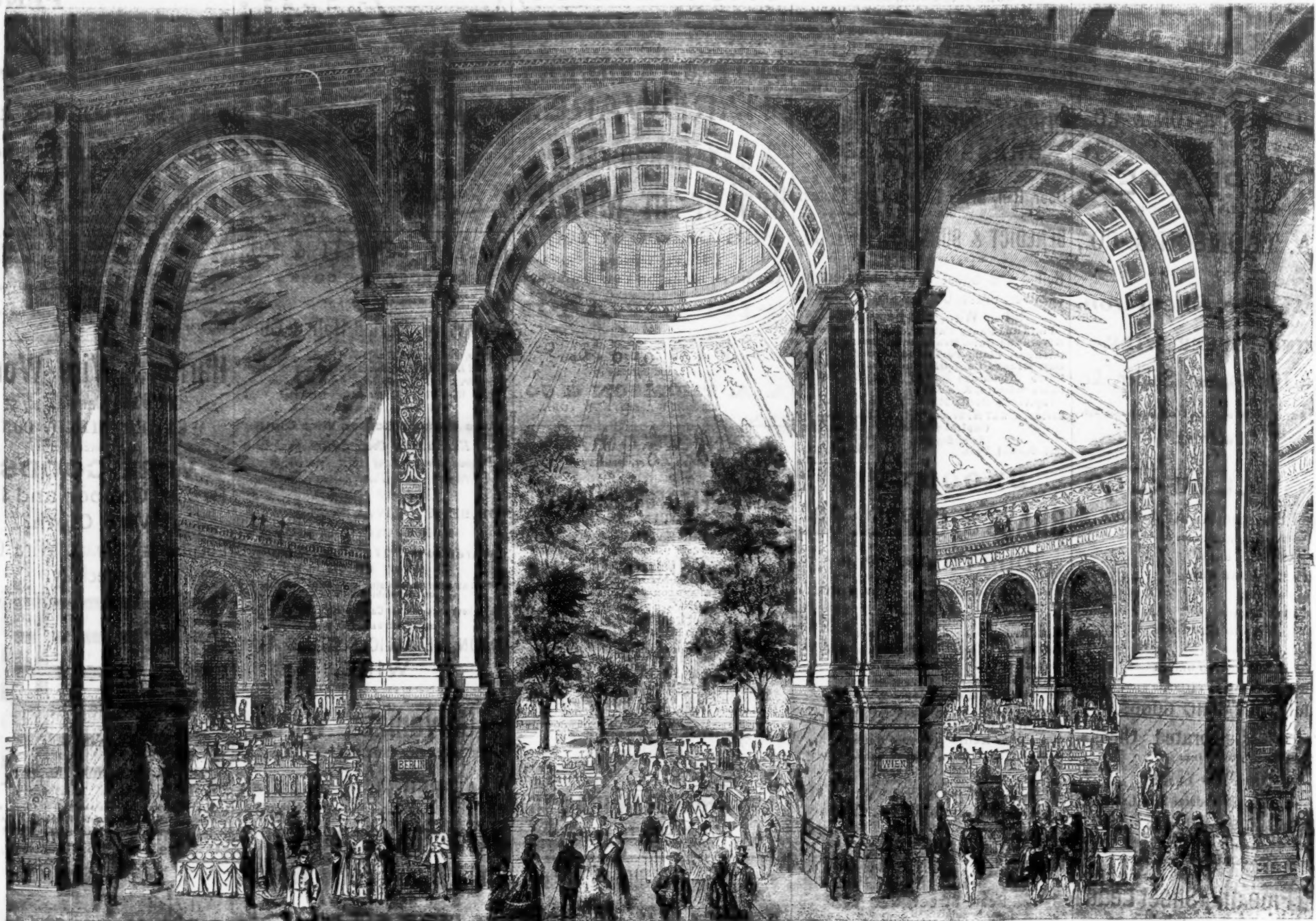
The first of May, which has been fixed upon as the opening day of the Universal Exposition, is drawing rapidly nearer, and as it approaches the interest in all the details of the exhibition becomes greater. We publish this week an engraving of the central rotunda of the immense building in which the fair is to be held, from which an idea may be gained of the colossal nature of the undertaking. As regards the present condition of the work of erection, the masonry and carpentry are finished, and in

the first place, has been fixed in the Prater, the great public park of Vienna, which is situated just outside the Leopoldstadt suburb, within a walk of 30 minutes from the center of the city, and is bounded on all sides by the principal branches of the River Danube. The Prater lies close to the town, and yet outside it. It is practically boundless in extent. The scenery in it is beautiful, and the levels are such that it was found perfectly easy to run a railway through it which should connect together the Staatsbahn and Nordbahn, and by means of these two latter be put in direct communica-

splits in two, encircling the latter as a kind of ring, or aisle. Intersecting the middle of this aisle is the great central transept, of the same height and breadth as the nave, which terminates at both ends in colossal triumphal arches, or entrances; while right and left, as far as the nearest of the small transepts, stretch handsome colonnades, which form a very fine facade to the central portion of the industry palace. Thus the rotunda is enclosed in a quadrangle 675 ft. 10 in. square, which, together with the cruciform portion of the nave and great transept, is destined to form a permanent group of

ing and zinc. The boilers, which will be contained in separate sheds at the back of the main building, will all be objects of exhibition; there will be five of these sheds, and consequently as many different sets of boilers, all intended for the working of the main shafting. It is intended to test their different qualities such as steam producing power, economy of fuel, freedom from priming, etc., and finally to award a prize medal to the system which gives the best results. Architecturally speaking, the machinery hall is anything but handsome from the exterior, though from the inside the immense

the numerous hydrants on the outside, and in the interior of every building; moreover, watch houses, each containing a fire engine complete, with the necessary contingent of men have been erected all over the grounds; these engines can draw their supply either from the water service or from tanks which have been specially erected for their use in every convenient position. In addition, the principal buildings are so constructed that they can be easily cut in two, and thus if a fire should arise it can be isolated, and confined to that portion of the building in which it originated.



GRAND ROTUNDA OF THE VIENNA EXPOSITION.

most of the transepts the flooring, and even the decorations are ready; but the erection of the central rotunda proceeds more slowly.

Much care and judgment have been used in the location and planning of the exposition buildings, in order to avoid the errors and inconveniences which characterized the preceding exhibitions at London and Vienna. The principal defects in these cases were:

1. The want of adequate direct railway communication to the doors of the exhibition.
2. The machinery department was always included in the same building as the general objects of exhibition, an arrangement which, from the noise and the smell of hot oil, was unpleasant to the general mass of visitors.
3. The fine art department was always associated with, and sometimes even mixed up with the general exhibition. This system exposed priceless objects of fine art to great risks from fire and other causes, and rendered artists and collectors extremely unwilling to exhibit their works and possessions.
4. The arrangement of the ground plan was such that visitors found it difficult to know where they were, or to find their way from the space belonging to one class of objects to that of another.
5. The system of lighting from the roof, the arrangements for which it is difficult, if not impossible, to render water-tight in temporary buildings.

To rectify these defects, the site of the fair,

tion with all the other railroads of the empire. This railway was accordingly made during the early part of last spring. Where it enters the exhibition grounds it spreads out into eleven branches or sidings, one or more running past the outside of each of the main buildings. By means of these sidings trucks containing building materials or objects of exhibition can be conveyed direct to the very spot where they are wanted. It was next determined that the buildings should consist of three main groups. One of these is reserved for general objects of exhibition. Another is appropriated to machinery of all kinds, and is parallel to the length of the industry palace. The third is the exhibition of fine arts: this is parallel to the eastern end of the industry palace, and is quite detached both from it and the machinery hall. The first of these groups of buildings, the industry palace, consists of a nave 2953 ft. long by 83 ft. 8 in. wide, and 73 ft. 10 in. high. This nave is intersected by sixteen transepts, each about 573 ft. 6 in. long, 51 ft. 1 in. wide, and 41 ft. high. The two transepts at each end are bound together by a short building parallel to the nave, thus forming four enclosed garden courts, while between the others the courts are open on one side. In the middle of the nave is situated the great rotunda, the dome of which, about 348 ft. in span, is the largest in the world, being fully one-third wider than the roof of the St. Pancras railway station. The nave, where it meets the rotunda,

buildings, which will remain as a monument of the exhibition long after the surrounding edifices have been removed.

The second great block of buildings, reserved for machinery, will, without doubt, be one of the most interesting features of this exhibition. It will consist of one continuous edifice, 2635 ft. long, by 164 ft. broad. There will be two central lines of shafting, and two lines of rails traversing it from end to end. These rails will be joined to the branch line running through the Prater, and by means of them it will be possible to unload each machine within a few feet of the spot destined for its erection. The building will be divided into a nave and two side aisles. Structurally the nave consists of a series of massive brick piers, on the tops of which rest the iron trusses of the roof. The piers are all connected together by flat arches springing from the middle of their height; the spaces above the arches are filled with windows, while the part below is left open as a free passage from the aisle to the nave. The aisles also consist of similar smaller piers, the panels between being taken up entirely by the windows. The roof of the nave is formed of iron trusses 96 ft. 9 in. in span, connected together by wooden purlins, and covered by planking laid diagonally, the whole being rendered water-tight by zinc plating, a material very much used in Austria instead of lead or slates. The aisles are roofed in by a simple lean-to, supported by iron girders, and covered by plank-

viata of piers and trusses has an astonishing effect.

The last of these three groups of buildings is the picture gallery; it is a handsome structure of brick cased with cement, and richly adorned.

No agricultural machinery will be admitted into the machinery hall, but will be exhibited in two separate buildings erected at the extreme southeast and northwest of the main building, the former to contain the agricultural tools and products of Germany, Austria and Russia, while the latter is reserved for England, France, Italy and America. This arrangement was rendered necessary by the lack of space in the main hall.

Broad roofed passages, with tiled or asphalt floors and open sides, have been erected, connecting the grand entrance to the park with the commission and custom houses, the industry place, the machinery hall, and the railway station. The tiles and asphalt employed in the pavement will be objects of exhibition, and prize medals as usual are to be awarded to the best specimens. The roofing is supported by carved wooden pillars. These passages, beside being found very convenient, will add greatly to the appearance of the grounds.

Precautions against fire have received more attention in this exhibition than on any previous occasion. Large water works have been erected, which give an unlimited supply of water at a pressure of 22 lb. per square inch to

The United States storeship, The Guard, which was to have sailed with a portion of the objects for exhibition, will not sail until March 1, thus postponing the time for receiving applications to Feb. 20. The United States will be better represented in the department of machinery and agricultural implements than any other, the space devoted to this department having been already fully engaged. Machines for the manufacture of silicon or Bessemer steel will be exhibited in this department, and two American engines will drive the machinery of the exposition. A fine collection of ores and minerals will represent our country's resources, and Pullman's palace cars will illustrate American traveling conveniences. The steamer Supply will sail soon after The Guard, but no applications for representation will be received later than Feb. 15.

The tin bearing rock from the north spur of Lake Superior has been analyzed at Detroit, and the *Mining Journal* reports, was found to contain twenty-four per cent. of tin. The *Journal* says there can no longer be doubt as to the genuineness of the discovery.

A discovery has been made of an extensive bed of iron ore in Washington county, Md., on the farm of Mr. William Dodge, near Clear Spring. It is stated that it contains about 55 per cent. of metallic iron.

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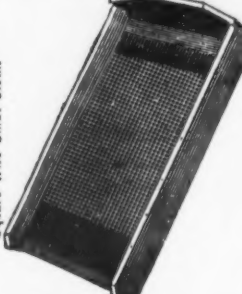
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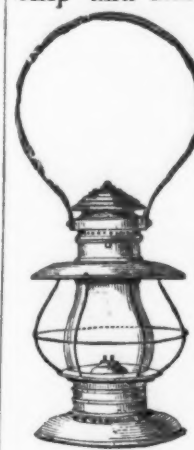
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New Patents.

We take from the records of the patent office at Washington the following specifications of certain patents lately issued, which will be found interesting:

Specification forming part of Letters Patent No. 134,304, dated December 24, 1872, issued to James A. Fersen, of Pittsburgh, Mass.

In the manufacture of spring wire horse rake teeth the teeth are sometimes hardened to shape by bending them upon a former, and, while held in bent position, immersing them in the hardening liquid contained in the hardening vat. When removed from the vat and from the bending mechanism or former, they are afterward heated and tempered; but, notwithstanding the hardening, when bent they sometimes fail to perfectly retain their bent shape, from want of uniformity of metal or from failure to become uniformly hardened, or from some other cause.

To remedy this difficulty each tooth is taken as it comes from the hardening vat, and preferably before it gets entirely cold, and placed in a holder that confines it positively in perfect shape, and then, while so held and confined, heated and tempered while upon the former, preferably using a former that will receive a series of teeth for each operation. It is in this process of tempering horse rake teeth while held to their ultimate form that my invention consists.

The holder consists of a curved steel bar, with steel pins extending therefrom, one pin being of a size to receive the eye of the rake tooth, and the other arranged in a series and in such relative positions, and at such distance apart, that when the wire is run through them, passing in front of one and back of the next, and so on through the series, it will have the curved form ultimately to be possessed by it. The pins are made sufficiently long to receive several teeth, each passing between the teeth. When the hardening process has reached the proper stage the formed teeth are removed from the hardening vat, and then, instead of being tempered without restraint as to form, each is bent to its proper shape between the pins, or by means of any other suitable holder that will confine the wire in shape, and the holder is then, with the tooth or teeth so confined or held by it, introduced into the tempering furnace, so that the tooth will be tempered to shape or while held in shape. The tooth thus made retains its form, so that in any departure therefrom by springing it invariably recovers its normal shape when released from strain.

In practice it is preferable to heat to temper before the teeth become wholly cold after hardening. Teeth thus made are not only much more perfect as to form or permanency of form, but are far less liable to break. The teeth may be hardened to form otherwise than by the specific process described, although that is considered the best method; but in every case the teeth are first hardened to form and are subsequently tempered upon a former.

Claim.—1. The improvement in the manufacture of spring teeth for horse rakes, consisting in tempering each tooth after it has been hardened by confining it in proper shape upon a holder and then heating both it and the holder together to give the temper.

2. A former for tempering rake teeth and similar articles, consisting of a plate provided with the upright pins for holding the tooth or teeth positively in proper position.

IMPROVEMENT IN REFINING IRON AND STEEL IN "RUN-WAYS."

Specification forming part of Letters Patent No. 133,090, dated December 3, 1872, issued to Samuel M. Wickersham, of Pittsburgh, Pennsylvania.

Figure 1 represents in perspective the runway, with the connected pipes for supplying air to the molten metal flowing through it; and Fig. 2 represents a vertical transverse section through the same.

The nature of this invention consists, first, in combining with a runway for conveying molten iron a series of perforated pipes, for the purpose of securing an equal distribution of air or gas to and throughout the runway; in using in a runway a tile or tiles, with an air-chamber along that side which bears or rests upon the pipes, so that the expansion of the pipes, if it occur, could not carry their air-openings past the corresponding openings in the tile, and so shut off the blast of air or gas; in a runway having an outer casing, in which a series of perforated air-pipes are imbedded in any suitable heat-resisting material to resist the heat of the molten iron, and withstand the violent bullition of the metal when subjected to the blast; in a runway having a series of tiles of suitable heat-resisting material, perforated for the passage of a blast of air or gas, and supported on a series of pipes for conveying the air or gas thereto; in a runway the casing and lining of which are made in separate sections, so that the side or sides may be removed for repairing the under portion thereof.

The runway as a whole is designed for refining pig-iron as it flows from a blast-furnace, or when remelted in a cupola or other furnace and flowed therefrom.

For the purpose of repairs, the runway is in three sections, A, B, C, of which the under section A is of a trough-shaped form, and the side sections B, C are connected therewith so as to be capable of being detached or removed for repairing the under section. The outer casing of the runway is made of wrought iron; but it may be made of other material, and angle-irons or lugs *a* may be made thereon for the purpose of bolting or otherwise attaching the sections together. In the interior of the under section A there is arranged any suitable number of perforated pipes, *c*, which are imbedded in and protected by any heat-resisting material, *e*, as seen in Fig. 2, but so as not to cover or interfere with the small air or gas openings in the

upper portions of said pipes. Over the perforated pipes *c* and the material in which they are set is a series of tuyere-tiles, *i*, made of any of the well-known fire or heat-resisting material, which tile may be made to rest one on each pipe, or to extend over and rest upon two or more pipes, as may be preferred; and along their under sides, or that portion thereof which is over the line of openings in the pipes, there is a recess, as seen at *l*, which forms a continuous chamber into which the air or gas from the pipe-openings passes, and from whence it flows through the small openings *2* through the tile, and mingles with the molten iron flowing through the run-way.

In case iron pipes are used they are liable to expand by the heat, and simple matched openings through them and through the tiles would

be shut off, closed, or obstructed. The channel or chamber *l* avoids all such contingency. The series of pipes *a* communicate with a main pipe *D*, from and through which the supply or blast is furnished. The sides B, C of the runway on their interior, as well as a portion of the under section A, are lined, as at *f*, with heat-resisting material, as seen in the drawing. The pipes *c* instead of being perforated with small holes may be slotted on top, so as to make a continuous air-opening, and the tiles with the tuyere-openings only may rest against the pipes, in which case the slot answers the same purpose as the air-chamber in the tiles.

Claim.—1. In run-ways for purifying or refining iron as it flows from a blast, cupola, or other furnace, a series of perforated pipes for equally distributing the blast of air or gas through the molten metal.

2. In combination with the perforated pipes, a series of tiles having a channel or chamber, *l*, over the series of small holes in the pipes, so that any expansion of the pipes may not obstruct any of the air or gas passages.

3. In a run-way for refining iron, the combination of an outer casing with a series of perforated air-pipes, *c*, imbedded and protected therein by the heat-resisting material *e*.

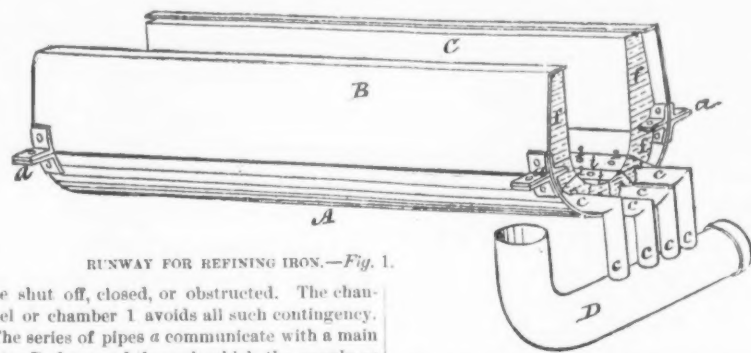
4. In a run-way for refining iron, a series of perforated tiles, in combination and supported upon a series of perforated air or gas conducting pipes.

5. A run-way composed of sections so united as that the side or sides with their linings may be detached from the under section, as described.

IMPROVEMENT IN REFINING IRON AND STEEL.
Specification forming part of Letters Patent No. 133,937, dated December 17, 1872, issued to Nathaniel B. Hatch, of Pittsburgh, Pennsylvania.

This improvement relates to the agitation and purification of molten iron or other metals inclosed within a stationary retort or crucible, or on a furnace hearth, by forcing through such molten metal streams of intensely heated deoxygenated or carbonized atmospheric air, obtained by previously passing atmospheric air through a body of fire or carbon in a highly heated or incandescent state; and in order to accomplish this, immediately under or in close proximity to the hearth, crucible, or retort a close chamber is arranged, in which is burned the carburizing material, and into which, at different points, above, below, or adjacent to the carburizing material, a series of air pipes provides the means of supplying air in the desired quantities and at the desired points. This chamber constitutes a holder as well as a heater, so as to keep the gas at a high temperature till it is introduced directly into the molten metal.

The illustration represents a transverse vertical section of the refining apparatus. A strong cylindrical metallic casing, *A*, and secured in a perpendicular position on a circular iron bed-plate, *D*. This casing is provided with an opening, *s*, therein, near its bottom, leading into that part intended for the ash pit *R*, and a similar opening, *T*, on a vertical line a short distance above, so as to open into the fire-box *N*. Each of these openings are to be closed by a tightly-fitting door, *o*, held in place by a yoke, *g*, and screw *t*, or any other mechanical contrivance that will answer the end. On the opposite side of this cylinder *A* is erected an air-receiver, *B*, which, by means of a large supply-pipe, *X*, is placed in communication with a powerful blast-engine; and by a series of smaller branch pipes, *c*, in connection with the interior of the cylinder *A*, the lowermost branch pipe leading directly into the ash-pit *R*, and the others above the grate *K*, at different heights, into the fire-box *N*. Each of these branch pipes is provided with a valve or cock, *u*, for regulating the admission of air either above, below, or through the fire. Above the grate and opening into the fire-box, *s*, is arranged



RUNWAY FOR REFINING IRON.—Fig. 1.

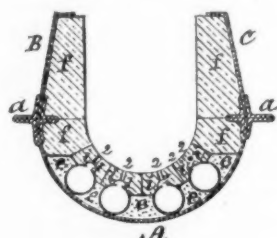


Fig. 2.

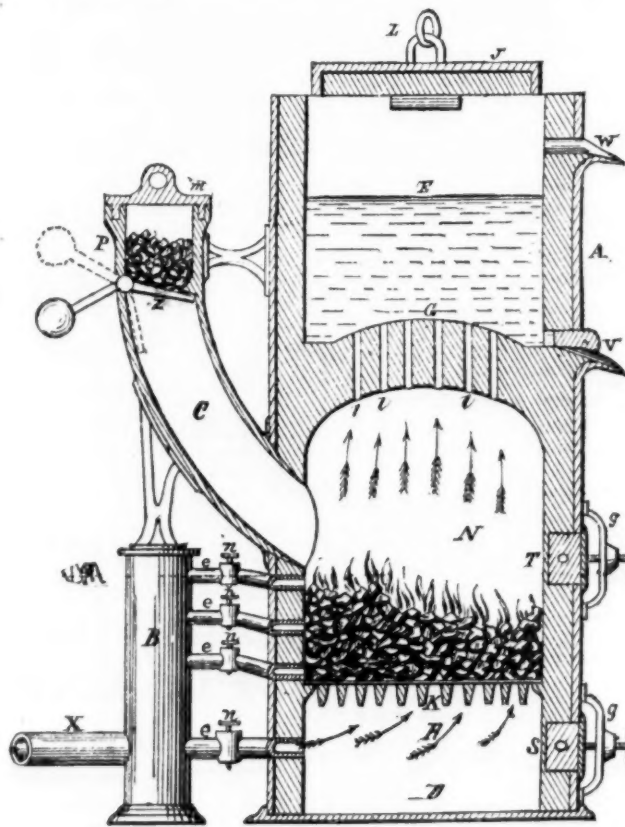
The several parts of this apparatus being constructed as shown, a fire is to be kindled on the grate *K*, and the doors closed perfectly tight, when a blast of air is to be turned into the ash-pit under the fire by opening the valve in the lowermost branch pipe *c*. The lid *J* is then placed on the mouth of the cylinder *A* in the manner represented in Fig. 1, and the fire increased by adding fuel through the chute *C* until the entire interior of the apparatus is brought to a high heat. The lid *J* is then to be raised and the upper portion of the cylinder above the arch *G*, constituting the retort or crucible *E*, teemed nearly full of molten metal. The blast, being increased in proportion to the quantity of metal poured in, rushes with great force through the fire, and the several small openings, *l*, in the arch *G* (prevents the molten metal from falling), and drives through the liquid mass, producing therein a violent ebullition, raising the impurities and foreign matter, as gas and scoria, to the surface, the gaseous matter escaping directly into the atmosphere, and the scoria removed by skimming, or allowed to flow off through the outlet *W*. As the refining process is carried on, the quality and condition of the metal may be regulated by attention to the several branch pipes, *c*, and their respective valves *u*. For instance, if it is desirable that the natural carbon in the metal should be retained, then the blast of atmospheric air must of necessity have its oxygen satisfied and surcharged with carbon previous to its entering the molten metal; otherwise such oxygen would search out the native carbon and utterly destroy it. To deoxygenate such air as may constitute the blast, it is caused to pass through a body of fire, by which the affinity of its oxygen for highly heated carbon is supplied or neutralized, and thereby converted into a carbonic oxide gas, which, being

decarbonized and partially oxidized condition. To reinstate, or rather replace, by other carbon the carbon so consumed, the blast is thrown once more under and through the body of fire, where its oxygen, taking up its equivalent of carbon, is converted into a carbonic oxide gas, as hereinbefore stated, which, in passing upward through the molten metal, gives up a portion of its carbon to the metallic oxides until they are completely saturated or satisfied, bringing the metal once more to a carbonized condition, and, if iron, giving it the quality of steel. As the metal becomes refined its density and gravity are increased, the heavier portion sinking to the bottom of the crucible, where it may be drawn off from time to time through the tap-hole *V*, and run into ingot molds, or otherwise, as the exigency of the case may require.

Claim.—1. A close chamber, *N*, for treating air, preparatory to utilizing the same in the purification of molten metals, such chamber being supplied with carburizing material, and having leading into it a series of air-pipes at different points relative to the carburizing material, whereby the air may be prepared for admission to the molten metal more or less completely deoxygenated and carburated, at pleasure.

2. The carburizing chamber and series of air-pipes of the last claim, arranged in combination with a furnace hearth, retort, or crucible, so as to discharge into the molten metal the air or gas at the same temperature and the same condition in which it leaves the deoxygenating and carburating material, substantially as set forth.

Improvement in Reciprocating Steam Engines.—Mr. Chas. E. Lamb, of Wauseon, Ohio, has invented an improved reciprocating engine, the distinguishing features of which are the arrangement and operation of an oscillating valve in the piston of the engine and the manner of introducing and exhausting the steam. On the end of a tubular piston rod a valve is arranged, within a center of the piston, and receives a rotary motion sufficient to change ports and allow the cylinder to take and exhaust steam at both ends at each stroke of the engine. This rotating motion is produced by means of a pin in the crotch of the connecting rod. On the end of the hollow piston rod is a collar, with two projecting lugs, between which lugs the pin works. The collar is made adjustable. By means of this adjustment the valve is changed or set so as to cut off the steam sooner or later, as may be required. The extent of this revolving motion depends upon the distance of the pin from the center of cross head. This distance is always supposed to be sufficient to turn the valve and change the ports as the crotch of the connecting rod is carried up and down by the engine crank. The steam is admitted through a tube, which is screwed into the end of the valve on the opposite side of the piston. This tube reciprocates in and is inclosed by an outside tube which connects with the boiler. As the piston works back and forth in the cylinder it is prevented from turning or partaking of the revolving motion of the valve by means of the straight rod which passes through the piston and is confined in the cylinder heads. The positions of the valve are reversed at every stroke of the engine, and the steam is admitted and performs its work and is exhausted with the same regularity and precision as with the ordinary slide valve, all the



IMPROVED FURNACE FOR REFINING IRON AND STEEL.

indifferent to the carbon in the metal as it passes through, attacks only the phosphorus, sulphur, silicon, and other impurities, which are volatilized and pass off as gas, or are driven to the surface in the condition of scoria, that may be allowed to flow off or be removed by mechanical means, leaving the metal in a highly carburated state. Should it be found requisite to discharge the whole or a portion of this carbon, the same may be accomplished by causing the blast to pass partially or entirely above the fire, by which it will enter the metal in varying conditions, or may be sent in as simple heated atmospheric air, carrying with it its oxygen, which, uniting with the carbon in the metal, consumes it, speedily bringing the metal to a

steam being admitted through a suitable pipe and exhausted through the hollow piston rod.

Steam Engine and Boiler Inspection in Philadelphia.—The fourth annual report of the Inspector of Steam Engines and Boilers states that in Philadelphia, during 1872, to the knowledge of the department, there was but one accident. This was the explosion on the 27th of May of the Phleger improved non-explosive steam-generator, at the establishment of Messrs. Troth, Garden & Brother, on Crease street, above Girard avenue, by which two valuable lives were lost. It was solely caused by the malconstruction of the boiler, which fact was fully confirmed by many experts

of undoubted knowledge. Had the inspector been notified, as the law requires, of the existence of this boiler, the disaster probably might have been avoided. Other boilers of the same kind have been constructed, but have been condemned by the inspector. Among the causes of injury to boilers is the continued use of water from wells which, from their situation, are subject to contamination from the destructive compounds and products of uric acid; the rapid destruction of the iron in the boiler, observed in such cases, points unmistakably to the cause, and the inspector had invariably recommended the discontinuance of this kind of water. During 1872 four boilers were condemned that had not previously been inspected. Two of these were for ill construction and two from defects of use. The number of boilers at present in use in the city, which are subject to city inspection, is as follows: Inspected by the department in 1872, 1157; insured by Hartford Insurance Company, 1038; balance subject to inspection, 805; approximate total, 3000. There were 169 more boilers inspected in 1872 than in the previous year. Of the 35 engineers examined, 5 received first class certificates; 14, second class; 11, third class, and 5, fourth class. Twenty engineers were re-examined, of whom 4 received first class; 12, second class, and 4, third class certificates.

Successful results have attended the use of "dualin" as an explosive agent at the ice-groge that has formed at White River Junction, Vt., situated at the junction of White River with the Connecticut River. When the freshet of January 17 occurred it carried the ice out of the White River into the Connecticut, forming a dam about a mile below the Junction, threatening, should it remain there and be reinforced by more ice with the spring freshets, the safety of five long and costly bridges near by. In this emergency it was determined to use "dualin" in the effort to remove the dam and clear the rivers. Since Monday last men have been engaged in work of exploding the collected ice, and no doubt is now entertained that in a few days the channels of the rivers will be open, and the broken ice will go drifting down to the sea. The immense power of "dualin" is developed when the substance is confined; otherwise it is comparatively harmless. It somewhat resembles sawdust, and the cartridges are shaped like Roman candles. In the present instance they are fired either by a battery and wire or by a fuse and caps, and at each discharge large masses of ice float down stream. A preceptible fall in the water at the dam at White River Village is already noted.

At Weston, England, experiments have recently been made as to the possibility of exploding gun-cotton by means of detonation, in a vessel full of water. They have been eminently successful. One of them was conducted as follows: A primer of about twenty ounces of dry compressed gun-cotton was thoroughly saturated and placed in a torpedo case, which was then filled with water and the primer was exploded by detonation. The result was a powerful explosion, sharper even than when air is the medium of sound, the incompressible medium of water being a better conductor of sound than the elastic air. The curious fact has thus been established, that wet gun-cotton is as explosible by detonation as dry gun-cotton; also, that no amount of moisture will render it inexplorable. In this it has an immense advantage over common gunpowder, which easily absorbs moisture from the atmosphere, and then becomes useless. The Weston experiments also demonstrated that the new explosive "picric powder," which is a mixture of saltpetre and picrate of ammonia, gave results but little inferior to gun-cotton, and is a valuable agent for certain classes of torpedoes, and for shells. Its reputation in regard to the latter has long been established, but it is singular that there has not long since been some official recognition of its merits.

Lead, next to iron, occupies the most important place in the mineral products of Missouri. The lead mines are now only partially developed, but they cover a vast area of territory, and will in time prove a source of great prosperity to the State. Foreign pig lead was for many years imported into St. Louis, but the quantity gradually decreased, falling in 1869 to 7857 pigs, and to nothing in 1872. During the past year the receipts of lead at St. Louis amounted to 285,769 pigs, or 22,882,650 pounds, of which 20,427,000 were produced in Missouri. The exports of lead from St. Louis, in 1872, amounted to only 4,718,223 pounds, leaving 18,164,427 pounds retained for home consumption. The soft brands of Missouri lead are chiefly used for the manufacture of white lead, rivaling for this purpose the best imported pigs.

In order to adopt it to such purposes as ballasting for railways, road metal, &c., the blast furnace slag at the George-Marie furnaces at Osnabruck, in Hanover, is allowed to flow from a height of eight feet into water, the effect of which is to convert it into large bean-shaped gravel; as fast as this is formed, it is lifted out of the water by an endless chain of buckets, which load it directly on the railway trucks.

The strike of the coal miners in the neighborhood of Springfield, Ill., has ended in the complete discomfiture of the strikers. After the weeks of idleness, they were compelled to work at the prices paid before the strike. Their families in many instances were suffering the suspension, for the variations while all branches of business were more or less affected.

New Jersey iron is *not* hence, steam has company in making advancements since of the British product of 1872 are as positive and which it previous those of 1862.

(Continued.)

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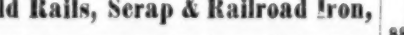
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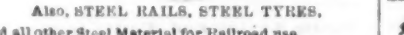


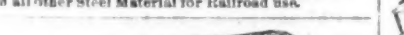
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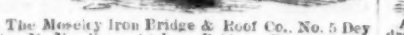


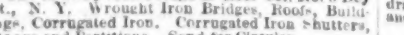


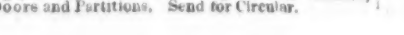


























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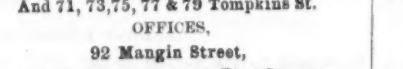
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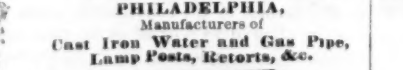
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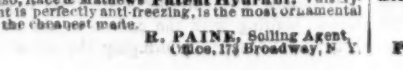


















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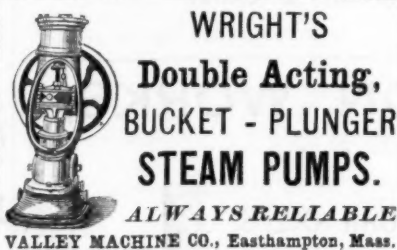


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STEAM ON THE ERIE CANAL.*History of Past Experiments and Past
Failures—Trials in 1871 and 1872—The
Necessities of the Canals.*

BY HENRY BOYNTON, M. E.

During the maple sugar season of the spring of 1858, a well-to-do farmer, of Western New York, whittled out a spiral or auger-like screw-propeller, in miniature, which he thought admirably adapted to the canal. He soon after went to Buffalo, and contracted for a boat to be built, with two of his Archimedian screws for propulsion by steam. Although advised by his builders to substitute the common four-bladed propellers, he adhered to his original design, and with one propeller at either side of the rudder—called "twin-propellers"—she was soon ready for duty. She is the vessel known to history as the Charles Wack. She carried three-fourths cargo and towed another boat with full cargo, and made the trip from Buffalo to West Troy in seven days, total time, averaging two miles per hour. But she returned from Troy to Buffalo, with half freight, in four days and 16 hours, net time; averaging three-and-one-fifth miles per hour, without tow.

This initiated the series of steamers from 1858 to 1862, and with others that soon followed, created a general enthusiasm in behalf of steam transportation, which led to a trip through the canal that fall, on a chartered steam-tug, by the governor of the State, the canal board, and other notables, and with public receptions, speeches, &c., at different cities along the route.

That boat was soon followed by the S. B. Ruggles, a first-class steam canal boat, built by the Hon. E. S. Prosser, of Buffalo, with a first-class modern propeller, and with double the engine capacity of the former. The P. L. Sternburg soon followed, and was a first-class boat, with modern twin-propellers, but with less engine capacity than the Wack. The same season there were some local steamers built to run regularly between different cities on the line of the canal. The following season of 1859 was the most active year the Erie Canal has ever known in regard to steam.

The C. Wack was sold to Mr. Prosser, who took out her Archimedian propellers, and substituted a modern propeller, and doubled her engine capacity, and reproduced her as the City of Buffalo.

The Gold Hunter was produced by the Western Transportation Company, of Buffalo. She was a short, oblong tub, with a square, box-like bow, and rounded stern, designed only to carry machinery and coal, and was to be recessed into the stern of ordinary horse-boats, by cutting away an equivalent space therefrom. She was designed to make a trip on the canal, and be immediately transferred to another boat for return trip, thus to avoid the usual loss at the terminal of the canal. She was abandoned after a brief trial.

The canal-boat Niagara had the Cathcart propeller supplied, which consisted of a union of the propeller and rudder by a universal joint in the shaft, and so adjusted as to unite them for steering purposes. This design was tried on the steamer Cathcart, upon the Chesapeake and Ohio Canal, in 1858, and with considerable newspaper *sensit*.

The Rotary, of New York, was a new steamer for freighting purposes, with a rotary engine and common propeller. This occupied but little space, and worked prettily on exhibition.

The Eclipse, of New York, was new, and had oscillating propeller engines.

SCREW TUGS.

The Gov. King was a medium-sized New York harbor propeller, and made repeated trips with three boats in tow, and one trip with five boats. She was so slow as to be unremunerative, as compared with horses.

The Western Transportation Co., after the failure of the Gold Hunter, built two powerful tugs, the Washington and Lafayette. They were soon withdrawn.

Mr. Prosser built the first-class tug, Stimers, but she had a short canal history.

The tugs, Bemis and Dan Brown, made good runs each, with three boats in tow, but were short-lived canallers.

PADDLE-WHEELS AND OTHER DEVICES.

During these years the paddle-wheel system was thoroughly tried, and under varied circumstances. As the locks prevented the use of side-wheels for full freights, an adjustable stern wheel was tried. This could be raised or lowered in adaptation to the light or full cargo.

The H. K. Viele was a first-class canal steamer, with stern wheel and vertical, or eccentric, acting paddles. These were considered by some as peculiarly well adapted to canal purposes, yet in practice proved otherwise.

The Fall Brook was built by Mr. John McGee, of Seneca Lake renown, for towing purposes, intending to establish a line between Seneca Lake and New York city; but her canal abilities were so poor as to cause her withdrawal to lake duty. She had powerful engines, with vertical acting paddle-wheel, set amidships between twin-hulls, with a full flow of water from bow to stern, and was decked across forward and aft of her wheel.

The Lady Jane, of Utica, was a bow paddle-wheel boat, with small engines. She accomplished but little.

As paddle-wheel canallers have proven less efficient than screw propellers, they are more limited in numbers. Other contemporary devices were tried. The canal-boat Oswego had her stern recessed to receive a submerged horizontal, centrifugal-acting water-wheel, which received water at a central and ejected it at a periphery opening for propulsion.

This opening could be turned for steering or backing purposes. She was altered at Greenpoint and received good machinery at Brooklyn, but was soon restored to horses.

Duck's-foot paddles were experimented with

at Buffalo. A scull propulsion was tried upon the Hudson. Also hinge-bladed propellers, to open and close with a fore-and-aft movement at the stern. This last device was tried by a Doctor Hunter, who has more recently tried a fish-tail propeller, the blades being made of rubber, to imitate the form and elasticity of the tail, with mechanical imitations of movement.

It is hardly necessary to add that these devices were all worthless, and others of miscellaneous character may have been tried, yet without merit.

WHAT ARE THE DIFFICULTIES.

Wealth, experience, and skill have marked this first era of steam, and though combined, they utterly failed. Both Mr. Prosser and the Western Transportation Co. were owners of fleets of splendid lake propellers, and were wealthy, with interests intimately identified with canals. It is evident there was no want, either of money, mechanical resources, or knowledge of canal business as basis of their failures with steam.

Capital flowed into the steam enterprise from various resources, and ambition multiplied experiments, but with no appreciable success.

The difficulties lay beyond the reach of capital and beyond the reach of known resources, and no adequate knowledge had been developed to solve the problem. Therefore, after suffering failures for several years, the State wisely volunteered to add extraordinary inducements by a large appropriation to encourage success. It could not have been to encourage the reproduction of former failures by the repetition of former trials. The inquiry is therefore proper, as a lesson from the history of the early era of steam, what are the difficulties? Why has steam failed so absolutely and so universally? Why did the State subsequently offer a large bounty to foster and develop steam?

Obviously there is some hidden difficulty, some unknown inability, because steam is the arbiter of the age, it is the great supreme motor of man's agencies throughout the world; hence we come from the sublime to the ridiculous when we use it to load boats at Buffalo, to be towed 350 miles by horses. The lessons of the early era are worthless for repetition. There is no better screw propelling machinery known than was then tried and abandoned; but the lessons are of value to discover the difficulties which must be remedied; to teach that the success of steam lies beyond the reach of publicly known mechanical resources.

The trials establish plainly and incontrovertibly that the failures were owing to the want of mechanical adaptation to required duty; to a mechanical inability to utilize the power of the steam; to a mechanical waste of power beyond their ability to control or remedy; and that the wasted power was extravagantly large and the utilized insignificantly small. A very intelligent captain of one of the best and most powerful steamers known to the Erie canal, who had a full and carefully kept log, stated that when his engine exceeded a hundred horsepower of steam, he could only equal twelve horses on the tow-path. Thus over seven-eighths of his power was wastefully developed in order to render one-eighth useful. But this occurred when he was moving only two loaded boats—the steamer and one in tow—but when moving four boats—three in tow—the percentage of utility was lessened, and he could not exceed eight to ten per cent. of his steam, as shown in slower movement, when fewer horses on the tow-path could equal him.

The steamer is a reservoir, and its rotatory power is free to be developed "inversely as its resistance." Hence, when fastened to a pier, it is all developed in its receding currents, and *per contra* when moving; if its machinery had a perfect fulcrum, it would all be developed in the run of the boat; consequently, on rivers and lakes, with fine lined steamers, that cut the water like a knife, it is like standing in a small boat and pushing from a large one, but on canals, with their full bows, it is like standing in a large boat and pushing from a small one; the little one runs away with the power. The more than 100 square feet area of immersed section of the full bow represents the large boat, and the dozen square feet effective area of propeller blades, set at an easy angle for spiral motion and recession velocity, is the little one that squanders the power so extravagantly. Increase in number of boats increases this contrast. The propeller blades of a good canaller will move 12 to 15 miles, in their line of spiral movement, to get two to three miles headway for the boat. A correct scientific analysis can trace the developments of the 85 to 90 per cent. of the inherent power of the steam that is wasted on the common canal boat, and that has no resultant effect whatever in the motion of the boat, just as positively as it can trace the co-developments of 15 to 10 per cent. that is utilized and that moves the boat.

The practical man sees the truths of these statements. He sees steam used with small, medium and large engines for canal purposes, and sees them all fail to meet the economy of transportation established by horses; but he would just as soon put men on the tow-path to compete with horses as to put horses into his elevators to compete with steam; and that, because in the elevators the power of the steam is chiefly utilized, whilst on the canal it is chiefly wasted.

It is therefore conclusive that there is an absolute necessity for a new mechanical system, for a radically different system of transmissive mechanism, for a system that can develop a considerable portion of the power of the steam in the movement of boats. The variations of the old systems of propulsion that are being continuously tried are worthless, in the very nature of the case, because they are in no sense a remedy for existing disabilities, and because they do not, in any sense whatever, meet the difficulties.

STEAM IN 1871 AND 1872.—SCREW PROPELLERS.

Soon after the Act of April, 1871, to foster

and develop the inland commerce of the State, the steam canal boat Cathcart was tried. She is like the Niagara of 1859, and has not been continued in the trade.

The canal boat George Barnard, afterward called the Andrew H. Dawson, was tried, and has run through the season of 1872. She has a common propeller in her bow, with a recess from the water line inclined to 20 feet aft to the bottom. Her propeller, therefore, forces the current against this incline and along the bottom in retardation of its progress. Hence, she cannot be expected to excel former trials.

The Eureka is an iron boat, built at Buffalo, with twin-propellers at her bow, set in recesses, at a diverging angle, to throw the water from the bow along the sides of the boat. She is built, by men of canal experience, with compound engines, and was designed to be a superior boat for canal purposes. But her mechanical currents at and against the bow must have a retarding tendency, not compensated by any other considerations.

The George A. Feeter is also a twin propeller, with diagonal, channel waterways on each side for about 25 feet, when they merge into a larger channel about five feet forward of the rudder. Her propellers are set in these channels, about ten feet aft their side openings. With her propellers thus housed the mechanical currents against the aft sides of her channels are very damaging to her efficiency.

The Wm. Baxter is also a twin propeller, like the P. L. Sternburg, of 1858, and with compound engines, like the Eureka and the Dawson. She is built of yellow pine, with easy lines, and so low as to be unable to carry five-sixths of a horse cargo of wheat or corn below deck, so that her lightness gives help to cargo, and her sharp bow and stern to speed. But her construction and model were long since abandoned by canal boat builders.

The Wm. Newman is a common propeller and double-deck boat, and carries 210 tons. She is much like the Ruggles of 1858, but has less steam capabilities.

The Charles Hemjee was built upon the Western Division, with a tunnel shaped encasement to her propeller. Of course she is reported as "very slow."

The John Durston had a propeller built in with her rudder, and driven with a vertical shaft, extending down through a cylindrical rudder post, but was unfit for service.

PADDLE WHEELS.

The Port Byron is a stern, paddle wheel boat, with vertical or eccentric acting paddles, and is like the Viele of 1858. She has a recess the entire length of her bottom of several square feet area, intended to facilitate a flow of water from the bow, but the flow does not occur; the mechanical currents of the wheel will be from the nearest water, and not from 90 feet forward.

The Montana is a similar stern wheeler, without the recess.

The Success consists of two sections, to be disconnected for passing the locks, with paddle wheel machinery at the bow. Her wheel inside of the paddles, is a drum or cylinder, filled with cork, to be buoyant, and the hull has an easy, scow bow, for the water to pass under the boat. Practically, the large drum makes her a horizontal, cylindrical bowed boat, and she mechanically throws the water therefrom against the scow shaped bow, and so that the cylinder displacement with the mechanical currents, and the scow bow displacement, combine to make her very slow. With her two sections she brought one and a half cargoes of corn.

The Excelsior has a horizontal, eccentric-acting paddle wheel, and was built of light iron at Greenpoint. She had a recess at the bow for her submerged wheel, and, when thus tried, found the retarding effects of the mechanical currents at and against the bow so great, as to cause her original bow propulsion to be made stern propulsion, when she was much improved. She was tried with cargo for a short distance on the canal, and withdrawn.

The Fountain City is a common boat, with machinery at her stern. She has two submerged horizontal, eccentric-acting paddle wheels, each of small diameter. These are placed under her quarters, in the rudder cross section, and she is steered by her machinery. The characteristics of these wheels are like the Excelsior's, and the eccentric variations of both—together with the Byron's, Montana's and Viele's—are known as old devices of secondary merit on river, lake and ocean steamers.

The Santiago is a scow boat, with a recess, or flume, the whole length of her bottom to a stern propeller. Her steam was soon abandoned.

An endless-chain propulsion was tried upon the Western Division, without success.

A common canal boat has been experimented with at Brooklyn to propel her by the reaction of a powerful blower or fan. This was driven first by a ten-horse, and next by a forty-horse stationary engine, and afterward by a forty-horse oscillator. Each failed to move her from her slip, and the conception proved an absurdity.

In addition to these, local steamers have been run between different cities for local purposes, more or less, since 1858, and steam tugs have been brought into requisition occasionally.

It will be observed that this review presents the important fact, that no new mechanical system has been introduced. The screw propellers and paddle-wheels are multiplications from the former era. The variations from the common propeller and paddle-wheel, in the miscellaneous devices, are all under reductions of merit. All the bow propulsions, and all the variations from the Viele, Sternburg, and Ruggles of the former, and the Byron, Baxter, and Newman of the present era, are inferior, whether viewed practically or scientifically. Hence, steam has received no mechanical advancements since 1858; and the efforts of 1872 are as positive and determinate failures as those of 1862.

(To be continued.)

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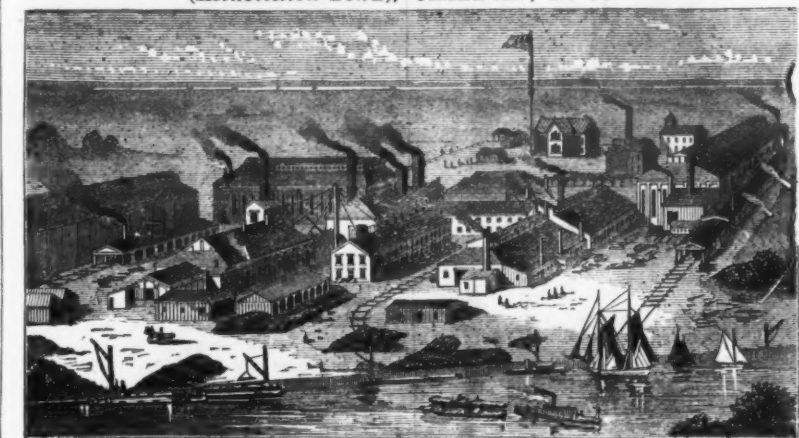
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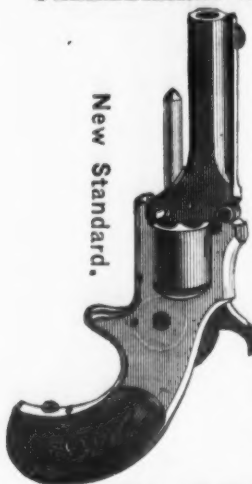
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The Bridge at St. Louis.

We take the following from the St. Louis Dispatch, regarding the present condition of the St. Louis bridge:

Taking the east abutment as the objective point of the description, we find the laborers were compelled to excavate 100 feet before a solid foundation was attained. Then the actual work of rearing the structure was begun, and from laying stone upon stone it gradually attained the height "from turret to foundation stone" of 212 feet. The immense amount of material required for the piers and abutments gives probably a clearer idea of what has been accomplished than any other fact connected with the bridge. No less than 110,000 cubic yards of stone, weighing 237,000 tons were used. If this immense pile had been built entirely above ground it would be represented by a solid mass about as large as the Southern Hotel. The main part is composed of magnesia, limestone and sandstone, with facings for the piers from two feet below low-water mark of red and gray granite. Of the latter kind 10,000 cubic yards were brought from an island on the coast of Maine by way of the Gulf of Mexico and the Mississippi, and, when set down in this city, cost \$40 a yard. Fortunately, the discovery of the fine quarries of red granite at Iron Mountain rendered it unnecessary to send East for further supplies.

At present the engineers are progressing with the work of placing large hydraulic jacks in the tops of the piers and abutments preparatory to finishing the work. These will be of immense power, each calculated to raise thousands of tons. They will be used—so soon as the weather moderates—to raise strongly built wooden towers upon which the chains that support the arch cords are to rest while being put together. These chains are perfect curiosities in their way, and for strength and size as far superior to anything of the kind ever heard of. The links are composed of one-eighth inch iron, six inches wide and thirty-five feet long. There will be five stands of these to each chain, which will be made of sufficient length to admit of their being extended over the wooden towers referred to, and about one hundred feet on each side. The idea is to use them for a purpose similar to that for which hog-chains are employed in the construction of boats, the great difference being that they can stand a tension equal to the hog-chains of all the steamers on the Mississippi. The arch cords referred to will be composed of staved tubes hooped like barrels, made of steel and in twelve feet lengths. There will be 1012 of these, 900 of which have been completed, and as the Keystone Bridge Company is manufacturing at the rate of 200 per month, this, the most important and largest part of the superstructure, will be completed in a few weeks. These tubes are perfectly straight, the arching being accomplished by turning a very slight bow in the side ends. They will fit together perfectly, and at the junctions will be secured by strong cast steel hammered clamps, with slats cut in the inside to correspond with a series of turned collars on the tubes. The two parts of the clamp will be drawn together, and the collar squeezed home by means of a large steel key and temporary appliances to each, running through corresponding orifices made in both. To these pins a hammered charcoal iron bar, 12 inches wide and 1 inch thick, will be fastened on each side and will thus connect the upper and lower pipe-cords, which are 12 ft. apart. Such is the perfection with which this work was calculated and done, that were either the beveling of the tubes or the turning of the slats and collars but a thousandth part of an inch wrong it would throw the arch several inches out of place only 12 ft. from the defective point. Indeed, the entire cord will, when finished, be as precise as the machinery of a clock.

There is every reason to believe that everything connected with it will move along smoothly when work is assumed in force, and that by the 1st day of July locomotives will be merrily whistling down brakes as they come near the East St. Louis approach, preparatory to crossing. In anticipation of this much wished-for event, it is proposed to let the contract for the erection of the East St. Louis approach on Wednesday next; and as the structure will be composed entirely of trestle and iron, competent engineers state that three months will be ample time to complete it.

A New Process of Steel Manufacture.

We take the following from the American Manufacturer, of Pittsburgh. The full specifications of this patent will be found in our issue of Jan. 2:

Some time ago we became cognizant of some experiments that were in progress aiming at the cheap and rapid production of steel from the iron without the necessity of melting the iron. As this process has been perfected and a patent granted for it, we are now at liberty to give our information in regard to it, and we are free to say if the same results can be obtained on a large scale that we know, from actual sight, have been on a small scale, the invention is not second to that of Bessemer.

The invention in brief consists of a process by which iron, by immersion in a molten bath for the space of from 15 minutes to one hour, becomes converted into steel.

In detail the process is as follows: By means of a magnetic coil or helix around a blast furnace or cupola, where Missouri ore (Iron Mountain, Shepherd Mountain, or Pilot Knob) is melted with coke, a dark product with slightly magnetic properties is obtained. This is spongy, light as to weight, and in melting boils up like molasses. This, when smelted in a crucible or open hearth, imparts to bar iron, heated or immersed therein, new pure iron, that permeates its structure, making it more dense, ductile and malleable.

A small per cent. of this dark product, when used in a common blacksmith's fire with coal, intensifies the heat—at the same time it acts as a flux upon the iron or steel that precludes its burning at a welding heat, so that Bessemer or other steels may be successfully welded without sand, clay, or borax—heated to semi-fluid therein. When Iron Mountain ore is melted in certain per cent. with pig or scrap metal a dense, bright, clear sounding product (very hard) is obtained. A small per cent. of this melted with the dark product, adding a little lime and oxide of iron, forms a bath of solution that imparts to bar iron immersed or boiled therein very fine steel properties. Such products work into the very finest cutlery, including plane bits and chisels, that will stand the hardest pine or oak knots. This product shows no steel properties until it is heated bright red and cooled off in water, when it assumes all the properties of fine steel. It may be successfully worked at a white heat without injury, or even welded in a blacksmith's fire without borax or any other protection from the air. A furnace is now being constructed in the West for the production of these new and valuable products of iron, with a view of bringing the matter practically before the iron and steel interests of this country. Missouri ore is named for the reason that any others have not been tried. We have specimens of these products in our office, and will be pleased to show them to parties who may call.

The Manufacturing Interests of Wilmington, Delaware.

From the recently published annual report of the Board of Trade of Wilmington, Del., it appears that the business of iron shipbuilding has been more than ordinarily active during the past year. It is stated that the present cost of iron ships upon the Clyde and at Wilmington does not differ by more than 10 per cent., and that, should the shipbuilders use the inferior irons represented as employed on the Clyde, the cost of production here and there would not materially differ. In the manufacture of cars, the report shows that a decided expansion has occurred, and such products of the city manufacture can now be found in all parts of the United States, the West Indies, Mexico, and South America. Another large car shop has been added to the industrial establishments of the city during the year, bringing the business up to proportions which are immense. In the production of car wheels a like increase has taken place. Over three hundred wheels per diem are turned out, and the business is daily increasing.

In the manufacture of morocco, the product has been quite as great as that of any preceding year. New firms have lately been established—an indication of increasing activity for the coming year. The value of the morocco manufactured during the past year was about \$2,000,000, and the capital invested in it about \$750,000. The manufacture of carriages, also, indicates a decided increase.

The report anticipates that the manufacture and working of iron will be the chief source of the prosperity and importance of the city in the future. The proximity of Wilmington to the mines, and its facilities for transportation, give it peculiar advantages. All the branches employing this material are augmenting; and with an enthusiasm not without foundation, the report ventures the prediction that, with the demoralization of the iron producing interests of Great Britain already induced by troubles upon the labor question, and the wealth and proximity of Pennsylvania mines, Wilmington is destined to become the Glasgow of America. The transportation facilities are as follows: The Philadelphia, Wilmington and Baltimore Railroad; Delaware Railroad; Wilmington and Reading Railroad; Wilmington and Western Railroad; Electric line of steamers to New York; two steam freight lines to Philadelphia; and steamboats connecting the city with the Jersey shore. The following statistics of industry for the year are appended: Number of tons of iron manufactured, 11,750; number of tons consumed, 50,000; value of iron manufactured, \$1,300,000; value of iron consumed, \$5,000,000; tons of bituminous coal consumed, 25,000; of anthracite, 60,000.

The Tin Mines of Missouri.

The following correspondence relative to the newly-located tin mines of Missouri, will be found of interest:

"POTOSI, Mo., Jan. 18, 1873.

GENTLEMEN:—In reply to your request that I would give my candid opinion as to the existence of tin in Madison county, Mo., I will say, that for more than twenty years have I firmly believed in the existence of tin in the well-defined quartz veins in said county. I have not hesitated to declare this my conviction, just as I did twenty-six years ago the existence of a tin region on the shores of Lake Superior, against book geologists of that day. I hazarded my reputation on that belief and opinion, and am now ready to do so; and proceed to give my reasons, founded upon the relations and associations of the rocks and metals.

At Drake Walls and Kit Hill, near Callington, in eastern Cornwall, there occurs oxide of tin ore, associated with silver-lead, ruby-silver, tungsten or wolfram and fluor-spar, and these several products in paying quantities in the same vein.

The same mineral associations may, also, be seen at the Tamar silver-lead mines, in western Devonshire. Also northward of Tavistock, in 1848, was found a wall or dike of dark hornblende trap, that yielded a small percentage of tin, and was worked for the same. These seams of trap or caples, as they are called by the miners, do not afford paying tin generally, but assist, at times, when the mining machinery is not otherwise employed. Now, in Madison,

county, Mo., may be seen similar dikes or walls of trap and greenstone in connection with the porphyries and granites. From these I do not think any profitable amount of tin will be obtained while the price of labor rules as high as at present, but to succeed in obtaining a supply of this valuable metal, we must sink upon the definite quartz veins that traverse the crystalline granite of Madison county, which are strongly marked, and in which I have been delighted to find a beautiful display of tungsten, or wolfram, associated with silver-lead and fluor-spar, the same as in eastern Cornwall.

The following is a copy of an analysis of the lead ore (taken by myself from one of these quartz veins), made by Prof. A. Litton, of Washington University, St. Louis:

St. Louis, Mo., May 2, 1872.

Prof. E. Shepherd:—DEAR SIR:—The specimen of galena you left with me, I find is argenteous, and according to my determination one thousand parts of it contain one and two-tenths parts of silver. Your truly,

(Signed),

A. LITTON.

Here, then, I have proof positive of the existence of wolfram, silver-lead and fluor-spar in the quartz veins of Madison county, Mo., notwithstanding little or no excavation has been made on any of these veins. Probably not one experienced mineralogist, or tin miner, in one hundred would for a moment doubt the existence of tin in these veins, if cut upon to the ordinary depth of the trial shafts in Cornwall; and I indulge in the hope, that in the course of the operations of the Missouri Tin Company, that they will not fail to make a thorough trial in this direction. Respectfully yours,

FORREST SHEPHERD, Economic Geologist, &c.

Coal in China.—According to Baron Richthofen and others, the Chinese coal-fields cover an area of upward of 400,000 square miles; 12,000 miles of coal have sufficed to make Great Britain the greatest workshop of the world. In the province of Hunan, a coal-field extends over an area of 21,700 square miles. There are two perfectly distinct coalbeds in Hunan, one bearing bituminous and the other anthracite; the latter being most conveniently situated with regard to conveyance by water, easily mined, and covering an area equal to that of the anthracite coal-fields of Pennsylvania. In quality this coal will compare favorably with the best kinds of anthracite known. The coal area of the province of Shanxi is of the enormous extent of 33,000 square miles. This is capable of supplying the whole world, at its present rate of consumption, for thousands of years, and has unrivaled facilities for mining. The beds vary from twelve to thirty feet in thickness, while the system of coal bearing strata in this province is about 500 feet in thickness, and contains, beside, an inexhaustible supply of iron ore. Ping-ting-chau is conspicuous for an extraordinary and exceptionally favorable juxtaposition of coal and iron.

The Allentown Chronicle says: If what is reported to us is true, the celebrated Hoffman iron mines, at Hoffmansville, in South Whitehall, are giving out, and that unless new veins should be struck, the lessees, the Bethlehem Iron Company, will stop operating them. These mines formerly were considered the best in the county for quantity and quality, but during the present winter what were seemingly solid walls of ore gave out, and banks of yellow clay met behind them. The mines were for a number of years lying idle, owing to the interruption by subterranean flows of water from the Jordan, until about a year ago the Bethlehem Company again took them in hand, and by the introduction of a number of powerful engines succeeded in putting them in a workable condition.

The employment of soluble glass, in the chemical and industrial arts, is constantly increasing, and its value is now fully established. Recently, a cement of great hardness and various applicability has been produced by mixing different bases with this singular substance. It is found that, combined with fine chalk and thoroughly stirred it will produce a hard cement in the course of six or eight hours; with fine sulphide of antimony, a black mass is produced which can be polished with agate, and possesses a superb metallic lustre. Fine iron dust gives a gray-black cement. Zinc dust produces a gray mass exceedingly hard, with a brilliant metallic lustre, so that broken or defective zinc castings can be mended and restored.

The great rolling mill at Bethlehem, Pa., now approaching completion, is said to be the largest in the world. The main mill is 356 feet long and 111 feet wide, the wings forming a cross 248 feet long, the whole being built in the most solid manner of stone, iron and slate. The boilers are outside the main works, the stacks being built of the most solid iron, riveted. They are 14 feet in diameter at the base and are about 120 feet high.

Government officers have been experimenting with submarine explosives at Block Island, Rhode Island, and have just blasted a rock known as "Peaked Rock," with a charge of twenty-five pounds of dynamite, equal in explosive force to three hundred pounds of gunpowder. The explosion shook the island like an earthquake, and threw a column of water and spray high into the air, while the rock was thoroughly broken up. The charges are all exploded by an electric battery.

Austria, though one of the continental countries which are richest in iron ore, is still obliged to look for her supply of iron, particularly rails and large rolled bars, to foreign markets, and even the fine structures of the forthcoming Vienna International Exhibition are made from foreign iron. This anomaly is simply caused by the great want of good mineral fuel in those districts where the iron ores are to be found.

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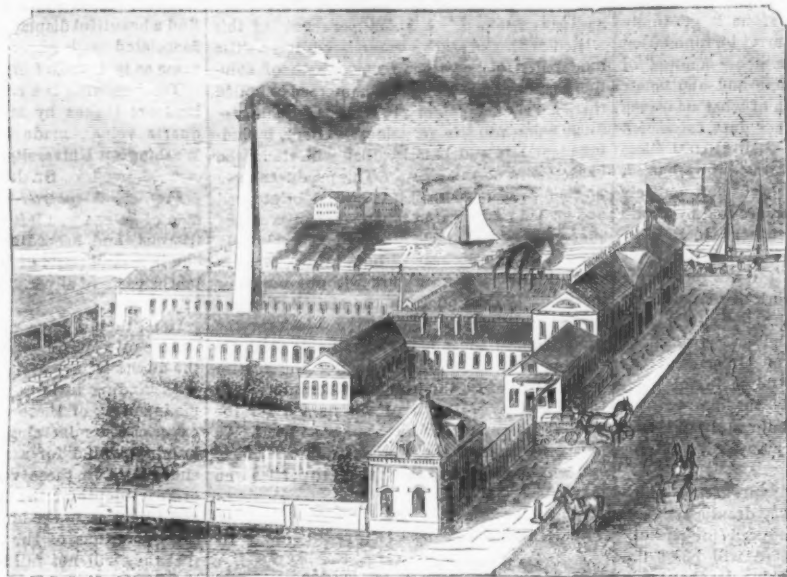
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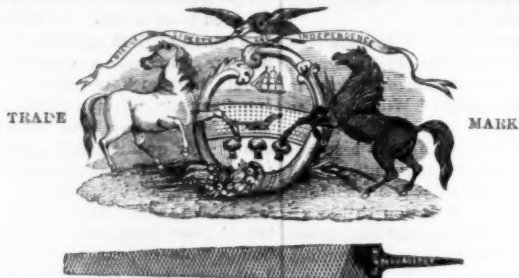
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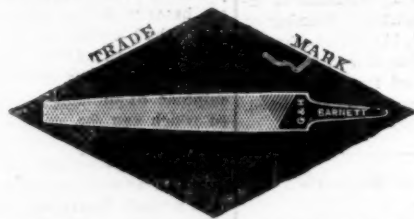
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Fig. 1—Shows Hanger with the Projection (A) corresponding with the Brace (D) of the Rail.
Fig. 2—Shows the Rail with Double Brace (D) and (E).
Fig. 3—Shows Sheave with Case Axle (B) and Shoulder (C).
Figs. 4 and 5—Show chills used to chill the Axle (B) and its bearings.

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Wheeling, W. Va., January 14th, 1873.

Messrs. OTIS BROTHERS & CO., New York.

Dear Sirs: The experience of a year proves that your Furnace Elevator is superior to all others in use. We have in the six weeks from December 1st to Sunday last, 12th inst., made 3734 tons, 1401 lbs. Pig Metal, or an average of near 65 tons per day, which required the elevator to lift 72 feet high 4½ tons Ore, Coke and Limestone for each ton of metal produced, or more than 11,500 tons material in the 6 weeks. The largest yield in one day was 81 1-4 tons iron, involving the lifting of 345 tons material in 24 hours. This has all been done to our satisfaction, and that, too, in the coldest weather we have had. Other furnaces with water and pneumatic hoists have experienced great difficulty, on account of the water freezing in the tanks; and in the case of the air hoists, we understand that two furnaces, not far from us, had to "blow out," from being unable to hoist stock during the "cold snap." The difficulty, we are told, was caused by the condensed moisture in the blast freezing to the sides of the cylinders, so that the piston could not move up or down.

Very truly, yours,

DEWEY, VANCE & CO.

Send for Circular to

OTIS BROTHERS & CO.,

348 Broadway, NEW YORK.

Biddle Manufacturing Co.,

FINE TOOLS

AND

Hardware Specialties.

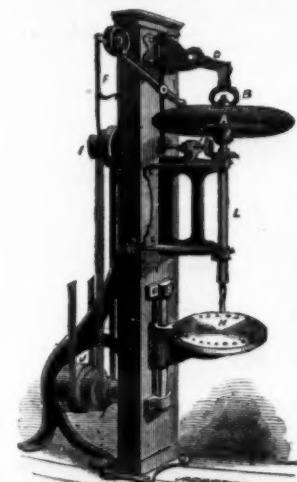
We call the attention of Carriage Makers, Machinists, Iron Rolling Manufacturers, Blacksmiths, and all others interested in Drilling, Punching or Cutting Iron, to our

Improved Drill Press, Shear and Punch,

feeling assured that upon examination their merits must be apparent to every one, from the fact that they possess the essential characteristics of strength, power and cheapness, in a high degree.

Illustrated Catalogues and Price Lists furnished on application.

We are also prepared to furnish light work of any description and in any quantity to order.



All kinds of Die Forgings promptly attended to.

OFFICE & WAREHOUSES, 78 Chambers Street, New York.

CHAS. BROMBACHER,

Tarrytown N. Y.

MANUFACTURER OF

TINSMITHS' TOOLS AND MACHINE PAPER-BOX MAKERS' DO.,

PRODUCE TRYERS, & C.

E. KETCHAM & CO., 289 Pearl Street, New York Agents.

Fire Department Supplies.

Hotels, Mills, Public Buildings, &c., furnished with Hose, Iron Piping, Hydrants and all kinds of Fire Supplies.

HOSE of every description.

Rubber and Brass Discharge Pipes, Hatz, Caps, Belts, Buckets, Trumpets, Axes, Hose and Ladder Straps, Spanners, &c. Patent SCREW and RING COUPLING and SPRAY NOZZLE.

Send for Price List.

ALBERT F. ALLEN, Providence, R. I.

BUSINESS ITEMS.

NEW YORK.

A boiler in Geddes' rolling mill, at Syracuse, exploded, Feb. 3, damaging the building to the extent of \$5000. Eight men were injured, one seriously.

North River Iron Works, Fletcher, Harrison & Co., have in course of completion an engine for the Hoboken Ferry Company, an engine for the steam yacht H. N. Smith, a pair of boilers for the steamboat Erastus Corning, a pair for the steamer Magenta, one boiler for the tow boat George Birkbeck, and are rebuilding a boiler for the Quarantine steamer Governor Fenton.

People's Iron Works, Messrs. Murphy, McCurdy & Worden, have on hand one new propeller engine boiler, 24 by 24, for the American Steamboat Company, of Providence, R. I., and a steel plate boiler for the new steamboat which is to ply between this city and Fort Lee. The firm is doing the usual amount of transient work.

The Peckskill Iron Company started the fires again in their blast-furnaces, on Tuesday, with over fifty tons of coal. The furnace has been undergoing repairs, and it is expected that from twenty-five to thirty tons of ore will be run per day. A railway track of two-feet gauge is now graded to the ore-beds, six miles distant, and a locomotive and train for track laying will be put on next Monday.

NEW JERSEY.

The Messrs. Watson, of Paterson, have embarked in still another enterprise—the making of all kinds of architectural iron—and they have already taken a \$30,000 contract for supplying the great quantity of fancy iron work to be used in the erection of the magnificent new Lenox Library, in Fifth avenue, Paterson. They propose to supply the material for the erection of the most elegant and ornamental of iron buildings, throughout, and put up the buildings, if required.

The shaft for the new water works at Pittsburgh, Pa., now being made at Paterson Iron Works, will be 22½ ft. long and 28 in. in diameter, and will weigh 23½ tons. The cranks will each weigh 10 tons, and in the rough, before being turned down, will be 42 in. across. They will probably be the largest cranks in the country. These already immense iron works are soon to be enlarged by the addition of a new machine shop, which will be at once pushed forward to completion.

The Danforth Locomotive and Machine Works, at Paterson, are building a number of locomotives for the Baltimore and Ohio Railroad, to be used for the heaviest kind of freighting. These engines are the largest ever made in Paterson, and will weigh about 45 tons, have cylinders 20x24 in., a firebox 10 ft. long, and 4 pairs of driving wheels. These works are also building a number of narrow gauge engines for iron ore railroads in Pennsylvania and New York. Nine engines per month is the capacity of these works.

The Paterson Press says: All the locomotive works, we understand, get their iron now from Cook's rolling mill, which is a high compliment to Paterson workmanship in general, and to that of Cook Brothers in particular.

The new buildings of the Watson Iron Bridge Works, at Paterson, will be ready for occupancy by April.

PENNSYLVANIA.

The high rate of taxation, and the want of proper facilities, are likely to cause the removal of a number of manufacturing firms from this city. Beside that of Morris, Tasker & Company to New Castle, Delaware, we also learn that the Shive Governor Company will remove their works about the 1st of April to Bethlehem, Pennsylvania, and that John L. Knowlton, machinist, has removed his establishment from Reed Street to Sharon Hill, Delaware County, Pennsylvania. Something should be done immediately to arrest this movement, or it may prove a serious injury to the commercial interest of the city. Lower and discriminating taxes on buildings devoted exclusively to manufacturing purposes might prove beneficial. —Philadelphia Trade Journal.

The work on the engines for both the Allegheny and Pittsburgh water-works has necessitated great additions to the Hartup shops, among which is a large foundry with iron cupolas, a casting pit, 21 feet in depth, and one of the most substantial cranes ever put up in the country, of 40 tons capacity. Numerous large castings, of from 6 to 16 tons, are in various stages of advancement, and the driving wheel for the Allegheny works is just approaching completion. This is 32 feet in diameter, and weighs about 100 tons.

The total property of the Allentown Rolling Mill Company—blast furnaces, rolling mills, spike factory, machine shops, foundries, and ore mines—is valued at \$2,000,000.

The Reading Bolt and Nut Works, of Reading, Penn., owned and operated wholly by Mr. J. H. Sternbergh, of that city, occupies about three acres of ground adjoining the Philadelphia and Reading Railroad Co.'s track, and comprises a rolling mill department, where all the stock of iron used in the works is manufactured, and a bolt and nut manufacturing department, where all sizes of machine bolts and lag screws are made; also hot-pressed nuts from the diminutive size used on a quarter-inch rod up to the largest size made in the country by machinery for a two and a quarter inch rod, both square and hexagonal. The works are in constant and full operation, employing about a hundred hands, and using the power of six steam engines. Mr. H. B. Newhall, of 11 Warren Street, N. Y., is agent for New York, New Jersey and the New England States.

A company now engaged in manufacturing sewing machines in Philadelphia agrees to remove its men and machinery to Dayton, if the

people of that city will take \$250,000 in the stock of the company.

The "Standard Nut Company," just organized in Pittsburgh, are the successors in the manufacture of patent hot pressed nuts and washers, railroad track bolts, spikes, fish bars, etc., of the long established and well-known house of James Wood & Co. The new company have purchased the extensive bolt and nut works of the Messrs. Wood, with all the processes and facilities, seconded by the same admirable system possessed by that establishment for this specialty. The president of the new company is Mr. Geo. G. McMurtry, late of the house of James Wood & Co., with Mr. Wm. H. Cassidy as secretary and treasurer.

The Huntingdon Journal says that the Rock Hill Iron and Coal Company intend building six furnaces and one rolling mill in that county.

The bolt and auger works situated at White Rocks, Fayette county, are shortly to be removed to Dunbar, where the building is now being erected.

The Sharpville Advertiser says: The Spearman Iron Company's furnace No. 1 had a remarkably good blow in. The second week of the blast she worked up to twenty tons a day, mostly foundry. Experts pronounce it an excellent start.

The Keel Ridge blast furnace, at Sharon, is again in operation.

The large furnace of Hooven & Sons, in Norristown, has been blown out for repairs.

An ax factory in connection with the Kittanning rolling mill is now talked of.

MASSACHUSETTS.

The new foundry buildings of the Sheffield Manufacturing Company have been completed, and operations commenced with a partial force.

At North Easton, the Ames Shovel Works are running on reduced time.

The affairs of the Acushnet foundry have been settled on the basis of 50 cents on the dollar. The establishment has been leased by the New Bedford foundry, and both are run by one management.

At North Dighton, the Dighton Furnace Company are making a great variety of cooking and parlor stoves, ranges, all kinds of wrought iron pipe, etc. They also manufacture the "Webster Hot Air Furnace." Their annual sales amount to about \$300,000.

The Boston and Fairhaven Iron Works are so driven with business that they are running their shops evenings.

At East Bridgewater, Messrs. Fearing Rodman & Swift are manufacturing chain cables of all descriptions, turning out from 15 to 20 tons per week, from ½ inch to 2 inch iron, and employing 25 hands.

The Industrial Iron Works, at New Bedford, has been leased to Linnell & Orney, by T. S. Viall, who has run it for several years.

The Russian government has contracted with Smith & Wesson, of Springfield, for 20,000 pistols. They will employ 600 men while filling the contract.

Shelbourne Falls is soon to have a manufactory for making the new locks invented by Major Henry Winn. A stock company is now forming for that purpose.

OHIO.

The mill and forge buildings of the Lake Erie Iron Company's rolling mill, at Cleveland, were burned Feb. 3. Loss not known, but very heavy.

H. C. Reid & Co., Warren, at present employ 30 hands in their new foundry and machine shop, and when they get in the additional machinery, etc., necessary, they will employ a working force of about 50 hands.

Brown, Bonnell & Co.'s rolling mill, Youngstown, has resumed operations. The company have made arrangements to procure all the coal they need from Pittsburgh, Pa. We understand that similar arrangements have been made by other manufacturers.

The Belfont Iron Works, during the year ended January 1, made 14,000 tons of pig metal and 146,000 kegs of nails. The amount of coal used in the rolling mill was 660,000 bushels. They have in their employ, at their mills, furnaces, keg and nail factories, and mines, about 500 men, and during the year paid out \$300,000 in wages. A new battery of boilers has been put in, and another blast engine will be put in shortly, which will increase the producing capacity of the furnace some 10 tons daily. Other important improvements are also in contemplation, among which is a plan for reducing the amount of coal necessary for smelting.

The citizens of Logan have raised a bonus of \$25,000 for a stone coal iron furnace, to be built in the place. The balance is to be furnished by foreign capitalists.

The coal house at Howard Furnace was burned on the 25th ult., and 350 loads of charcoal were destroyed. Loss, \$6000. The insurance had just expired at noon on the day of the fire.

The Silicon Steel Works, at Sandusky, are nearly finished.

The subject of the building of a steel works in Springfield is being agitated in that city.

Now that Massillon is assured that a rolling mill will be located there, other manufactures are being talked of.

MICHIGAN.

Morgan Furnace, located at Morgan village, 8 miles from Marquette, is undergoing important changes, which will be completed early in February, and will add materially to its productive capacity. Experiments are being made, at this furnace, with the rotary puddler, but with what degree of success it is yet too early to determine.

Carp Furnace, which the Carp Iron Company is building, near Marquette, is nearly ready for its machinery, and the prospect is that the furnace will be ready for making iron in the spring. This will be a 9-foot charcoal furnace, stone stack. In addition to the furnace, it is the design of the company to erect establishments for the manufacture of bolts, nuts, spikes, wire, and wire rope. The capital of the company is \$500,000.

Saws.

Keystone Saw, Tool, Steel & File W'ks,

Front & Laurel Sts., PHILADELPHIA, PA.

HENRY DISSTON & SONS,

having rebuilt that portion of their extensive Works destroyed by the conflagration of Nov. 15, 1872, and having introduced new and improved Machinery for the Manufacture of every Article of the Trade, are prepared, with their increased facilities, to fill all orders with punctuality, promptness and dispatch.

H. W. PEACE,

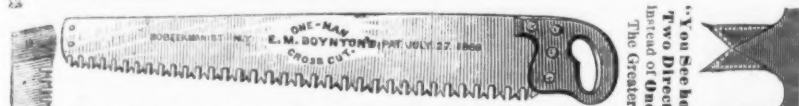
MANUFACTURER OF

SAWS OF ALL KINDS

FACTORY, WILLIAMSBURG, N. Y.

BOYNTON'S LIGHTNING SAWS.

Front Edge View showing two points of M tooth dressed to cut in line on one side, and two on the other.



The Lightning One Man Cross-Cut, for Cutting Wood, Joists, Logs and Timber, and Sawing Down Trees.

The Lightning Saw has been awarded the American Institute Medal, 1872.

The superiority of the Lightning Saw over all others is now established beyond dispute. No man has ventured to put his saws in competition with them at the American Institute or elsewhere; and the challenge of \$500 for a public trial has never been accepted. Wherever power and speed are wanted—wherever time and strength are too valuable to be wasted, these Saws will assert their claim. One source of their power is that the teeth are formed to cut both ways, and each tooth having two direct cutting edges instead of one scraping point, it plows a clean groove through the wood, while the other teeth only crush their way through under hard pressure.

Facts and opinions given by gentlemen of the highest character, from their own observation and experience, fully sustain all that can be said in praise of this invention. J. W. BLAKE, Esq., Superintendent of the American Institute, writes: "For all purposes of cross cutting large or small timber, your cross cuts and wood saws have no rival in speed or ease. Their universal use would save a vast amount of money and time, and lighten the labor of millions of men."

At the Bedford Farmers' Club, at Katonah, January 26, 1873, a leading farmer of Westchester county said that he had used the Lightning Cross-Cut Saw the last year, and that two men could cut more wood with it in one day, than in three with any other saw.

A practical lumberman also writes: "It is as easy to cut 20 to 25 thousand feet with the Lightning saw as 8 to 10 thousand with the old V tooth. We get 80 cents per thousand for cutting—so the difference would pay for a saw in less than one day's work."

The Lightning Saws are now in use and for sale in every State and Territory of the Union, and are sent to foreign lands; indeed to very quarter of the world. More than 100,000 purchasers during the year 1872 add their testimony to the claims of superiority of the Lightning Saws.

These Saws are of all sizes, from the fine hand-saw of one foot long, to the ten-foot California Cross-Cut. Two men can use the one-man saw, by attaching one of Boynton's Patent Handles, removable at pleasure. Many imitations are abroad that are deficient in some essential features, and I am prosecuting infringers in the United States Courts. None are genuine unless they bear the name of E. M. BOYNTON, and the date of the four patents. Every such saw has been rigidly inspected before leaving the factory, and is warranted to cut to touch ends without injury. A six-foot Cross-cut and a Buck-saw blade will be sent for Six Dollars. For Catalogue, Price List and additional information, please address

E. M. BOYNTON,

Sole Proprietor and Manufacturer,

80 Beekman St., New York.

Hankins' Elliptic Forked Saw Frame.

Patented June 28th, 1870.



The annexed engraving represents HANKINS' ELLIPTIC FORKED SAW FRAME, which commends itself to the trade for its simplicity of construction. The Forked Brace being all in one piece, without any centre bolt, secures for the Frame great strength and durability.

These Frames are put up with my best Webs, marked "No. 40, Harvey W. Peace."

HARVEY W. PEACE,
VULCAN SAW WORKS,
WILLIAMSBURG, N. Y.

AMERICAN SAW CO.,

No. 1 FERRY STREET NEW YORK.

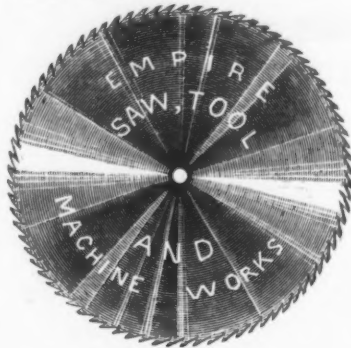


Solid saws require frequent gumming, thereby subjecting them to risk of springing or breaking. This is especially the case with cross cuts having Patent Teeth. In the perforated saws all gumming is avoided, and the teeth are easily kept long and in proper shape, saving time, labor, expense and wear. It is well known, our saws cut faster, smoother and easier than any other.

MOVABLE-TOOTHED CIRCULAR SAWS AND SOLID SAWS OF ALL KINDS.

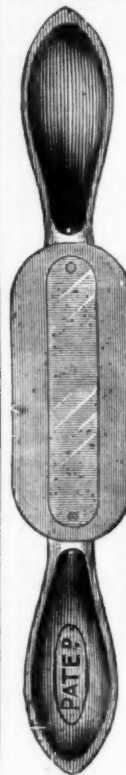


SAMUEL R. KENNEDY. JAMES ECCLES.
Samuel R. Kennedy & Co.,
2423, 2425, 2427 Lombard Street,
PHILADELPHIA, PA.

Manufacturers of
Saws of all kinds,

Including: Circular, Mill, Cross Cut, Hand, Panel, Rip, Back, Butcher and Compass, Turning, Felloe, Billet and Machine Webs, Also Shafting, Pulleys and Hangers, Lift and Force Pumps, Screw and Hydraulic Presses for Bookbinders and others. Saw Mandrels, Punches, Shears, &c.
Our Saws are Beveled by the most improved Machinery known to the trade, and are fully warranted. Catalogues on application.

FRONT VIEW.



BACK VIEW



LLOYD, SUPPLEE & WALTON,

WHOLESALE

HARDWARE HOUSE,

AND

HARDWARE FACTORS.

BATES' MANUFACTURING CO.'S GOODS.

Bonney's Pat. Hollow Augers & Spoke Trimmers.

Bonney's Patent Double-Edged Spoke Shave.

Bonney's Patent Adjustable Gate Hinge.

Bonney's Patent Sash-Fast and Lamp Bracket.

625 Market Street,
PHILADELPHIA.

COFFIN TRIMMINGS,

MANUFACTURED BY

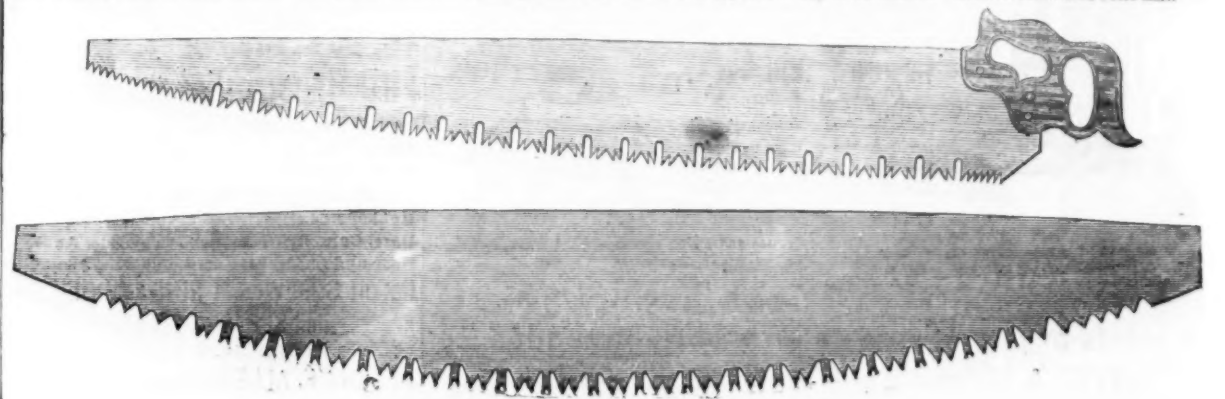
WAYNE HARDWARE CO.,

124 Main Street, CINCINNATI, O.

J. FLINT & CO.,

Manufacturers of all kinds of SAWS and PLASTERING TROWELS, Rochester, N. Y.

A large Stock of Cross Cut Saws constantly on hand. Orders filled promptly. Dietrich's Double Handle One Man Cross Cut Saw made with any kind of tooth desired. Our patent method of grinding Hand Saws makes them superior to any in the market. Send for Illustrated Price List.



Saws.

WHEELER, MADDEN

&

CLEMSON

Manufacturers of Warranted Cast Steel

SAWS

OF EVERY DESCRIPTION,

including

Circular, Shingle, Cross Cut,

Mill, Hand, Roberts' and

other Wood Saws,

&c., &c.

CAST STEEL FILES

of the well-known brand of

WHEELER, MADDEN & CLEMSON.

FACTORIES:

Middletown, Orange Co., N. Y.

BRANCH OFFICE:

97 Chambers Street, New York.

Brundage Forged Horse Nails,

Manufactured from

BEST NORWAY IRON,

by BRUNDAGE & CO. Sold by

Wheeler Madden & Clemson,

MIDDLETOWN, ORANGE CO., N. Y.

LIVINGSTON'S

PATENT BRACED

WOOD SAWS,

Pat. BUTCHER & KITCHEN SAWS

Recognised Standard Goods for durability, quality and finish.

For sale by the Hardware Trade and

T. F. Cheritree & Co., New York.



We make a specialty of the LARGEST SIZES of Circular Saws, and call particular attention of lumber manufacturers to the following points of excellence

EVENNESS OF TEMPER.

The peculiar structure of our furnace subjects all parts of the saw to a DEAD heat, and when dipped in the oil bath secures perfect uniformity.

PERFECT ACCURACY IN THICKNESS.

Our saws are ground on a patent machine, automatic in its operation, grinding off the thick places upon the plate before the thinner parts are reached, and when the saw is removed BALANCES PERFECTLY, which is proof positive of the right accomplishment of the work.

PROPERLY HAMMERED.

Great care is taken that no saw shall leave our works without due attention in this important particular. A saw too tightly strained upon the rim, or too loose in the center, can not be successfully run—hence the importance of so hammering the saw as to effect equal strain in all its parts, and at the same time RUN TRUE. This department is under the personal supervision of our Senior, who has devoted over twenty years to the art of saw making.

We are sole proprietors and manufacturers of the celebrated "Clipper" Cross-Cut Saw. Price Lists of all kinds of saws sent on application.

OHLEN & LANMAN.
Columbus, O.

Charles E. Little,

Successor to CHAS. S. LITTLE, 59 FULTON ST., N. Y.

COOPERS' TOOLS, TRUSS HOOPS,
General Hardware, &c.,

At Wholesale & Retail.

Particular attention given to the various Tool Departments. Send for catalogue.

Cutlery.

Landers, Frary & Clark,
New Britain, Conn.,
MANUFACTURERS OF
TABLE CUTLERY
OF EVERY DESCRIPTION, ALSO,
General Hardware,
IN VERY GREAT VARIETY.
298 BROADWAY, N. Y.

HENRY DICKINSON,
Sheffield Cutlery, Files, &c.,
66 & 68 READE STREET (near Broadway), NEW YORK.

Manufactured in SHEFFIELD, ENGLAND.

Isaac Milner's Fine Pocket and Table Cutlery.

Howard Bro.'s Medium Pocket Cutlery.

J. B. Osberton & Co.'s Medium Table Cutlery.

Isaac Milner's Razors, Butcher and Hunting Knives.

Hargreaves, Smith & Co.'s "Imperial" Files.

Milner's "X" and Collins' "IXL" Hand Saws.

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REPRESENTING
GEO. WOSTENHOLM & SON
CUTLERY AND RAZORS,
WASHINGTON WORKS, SHEFFIELD,
CORPORATE MARK.**FRED'K WARD & CO., SHEFFIELD,**
CUTLERY & TABLE KNIVES,
CORPORATE MARK.**B4*ANY****POCKET KNIVES,**
KNIVES & FORKS,
RAZORS,
SCISSORS, FILES, CHAINS,
ANVILS, VICES,
GUNS.**CORPORATE MARK,****Joseph Rodgers & Sons'****CELEBRATED CUTLERY,**
No. 82 Chambers Street, New York.
CHARLES PEACE, Jr., Agent.

The demand for Joseph Rodgers & Sons' productions having considerably increased, they have, in order to meet it, greatly extended their Manufacturing Premises and Steam Power.

To distinguish Articles of Joseph Rodgers & Sons' Manufacture, please to see that they bear their Corporate Mark.

JOSEPH S. FISHER,
No. 411 Commerce St., PHILADELPHIA,
AGENT FOR**George Wostenholm & Son,**
Washington Works, SHEFFIELD,
Celebrated I-XL Cutlery, Razors, &cSOLE AGENT FOR THE UNITED STATES OF
WALTER SPENCER & CO.,
Steel and File Manufacturers,
Rotherham, ENGLAND.

Corporate Mark.

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ROTHERHAM

Granted 1777.

RICHARD A. TURNOR,
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Agent for**F. W. HARROLD,**
Hardware Commission Merchant,
BIRMINGHAM.**JOSEPH ELLIOT & SONS,**
Manufacturers of Razors, Table Knives, &c.,
SHEFFIELD.

NEW YORK KNIFE CO.
MANUFACTURERS OF SUPERIOR

Table & Pocket Cutlery,
WARRANTED TO BE MADE OF THE BEST MATERIAL.**WALKILL RIVER WORKS,**
Walden, Orange Co., New York.

THOS. J. BRADLEY, President.

The Miller Bros. Cutlery Company,
Manufacturers of Patent**FINE PEN AND POCKET CUTLERY,**
WEST MERIDEN, CONN.

We warrant our Knives equal in cutting qualities and workmanship to any made. We also make

SILVER PLATED POCKET KNIVES,
which will not rust or become discolored when used as a Fruit Knife, and their cutting qualities are equal to any other Knife.**CLARK, WILSON & CO., Agents,**
81 Beekman Street, NEW YORK.**REMOVAL.**
We have removed from No. 68 Beekman Street, to the new and commodious store, No. 101 & 103 Duane Street, near Broadway, where will be found our usual assortment**GUNS, PISTOLS, CUTLERY**
FISHING TACKLE.
And Sporting Articles of every description.Agents for
Alexander's Pocket Cutlery,
J. W. Court's Fish Hooks,
Union Repeating Pistols,
W. & S. Horrabin's Pocket Cutlery.
Sheffield, Eng.**BARTON, ALEXANDER & WALLER**
101 & 103 Duane St., New York.**NIXON & Winterbottom,**
PYRAMID WORKS, Sheffield, Eng.

Manufacturers of Table Cutlery, Butcher Knives, Bread Knives, &c., by patent and Improved Machinery. Agents: U. S., Smith & Hall, 58 & 60 Reade St., N. Y.; Canada, Thos. Ellis & Co., Sheffield, Eng.

WALSH, COULTER & FLAGLER,
83 Chambers and 65 Reade Sts., New York,
AMERICAN AND FOREIGN**HARDWARE,**
SOLE AGENTS FOR THE SALE OF**JOHN ROTHERY'S**
CELEBRATED FILES.
Walden Co-operative Knife Co.
SUPERIOR POCKET CUTLERY.**The Family Cherry Stoner.**
The only really practical cherry stoner ever made. It does its work perfectly, without mashing the fruit.**D. H. GOODELL, Sole Manufacturer,**
Office & Salesroom, 55 Chambers St., N. Y.
Works at Antrim, N. H.

P. S. I am also sole manufacturer of Turn Table and Lightning Apple Parers, Lightning Peach Parers and Climax Apple Corers.

Highest and Lowest Monthly Quotations of Cash Copper (Lake Ingot), at New York, from 1862 to 1872, Inclusive.

Month.	1862.	1863.	1864.	1865.	1866.	1867.	1868.	1869.	1870.	1871.	1872.
	Highest.	Lowest.	Highest.	Lowest.	Highest.	Lowest.	Highest.	Lowest.	Highest.	Lowest.	Highest.
January.....	28 27 35 31	41 39 50 46	42 38 50 46	42 38 50 46	42 38 50 46	42 38 50 46	42 38 50 46	42 38 50 46	42 38 50 46	42 38 50 46	42 38 50 46
February.....	28 25 37 35	42 41 51 48	44 38 51 48	44 38 51 48	44 38 51 48	44 38 51 48	44 38 51 48	44 38 51 48	44 38 51 48	44 38 51 48	44 38 51 48
March.....	25 23 37 31	42 41 51 48	44 38 51 48	44 38 51 48	44 38 51 48	44 38 51 48	44 38 51 48	44 38 51 48	44 38 51 48	44 38 51 48	44 38 51 48
April.....	23 21 31 30	44 42 52 49	44 42 52 49	44 42 52 49	44 42 52 49	44 42 52 49	44 42 52 49	44 42 52 49	44 42 52 49	44 42 52 49	44 42 52 49
May.....	23 20 30 30	44 43 53 50	44 43 53 50	44 43 53 50	44 43 53 50	44 43 53 50	44 43 53 50	44 43 53 50	44 43 53 50	44 43 53 50	44 43 53 50
June.....	23 20 30 30	48 44 54 51	48 44 54 51	48 44 54 51	48 44 54 51	48 44 54 51	48 44 54 51	48 44 54 51	48 44 54 51	48 44 54 51	48 44 54 51
July.....	24 22 32 29	55 48 58 55	55 48 58 55	55 48 58 55	55 48 58 55	55 48 58 55	55 48 58 55	55 48 58 55	55 48 58 55	55 48 58 55	55 48 58 55
August.....	24 24 31 29	52 47 57 54	52 47 57 54	52 47 57 54	52 47 57 54	52 47 57 54	52 47 57 54	52 47 57 54	52 47 57 54	52 47 57 54	52 47 57 54
September.....	27 24 32 31	52 47 57 54	52 47 57 54	52 47 57 54	52 47 57 54	52 47 57 54	52 47 57 54	52 47 57 54	52 47 57 54	52 47 57 54	52 47 57 54
October.....	32 27 34 32	48 47 57 54	48 47 57 54	48 47 57 54	48 47 57 54	48 47 57 54	48 47 57 54	48 47 57 54	48 47 57 54	48 47 57 54	48 47 57 54
November.....	32 30 39 34	49 47 57 54	49 47 57 54	49 47 57 54	49 47 57 54	49 47 57 54	49 47 57 54	49 47 57 54	49 47 57 54	49 47 57 54	49 47 57 54
December.....	31 30 39 38	50 48 58 55	50 48 58 55	50 48 58 55	50 48 58 55	50 48 58 55	50 48 58 55	50 48 58 55	50 48 58 55	50 48 58 55	50 48 58 55

Average Prices of Store Warrants, Scotch Pig Iron, by Months, from January 1850 to December 1872.

	1850.	1851.	1852.	1853.	1854.	1855.	1856.	1857.	1858.	1859.	1860.	1861.	1862.	1863.	1864.	1865.	1866.	1867.	1868.	1869.	1870.	1871.	1872.
January.....	48.6	43.9	36.3	66.3	76.0	66.9	76.3	73.7	54.6	53.6	57.7	49.2	48.8	51.6	61.0	49.8	66.4	51.4	52.1	55.2	56.6	51.6	71.7
February.....	47.7	42.6	36.3	55.1	77.9	69.9	73.0	56.3	52.7	53.8	57.9	49.7	49.7	52.4	60.8	50.3	71.1	53.9	52.4	55.2	54.8	52.3	75.8
March.....	44.7	41.6	36.3	55.1	77.9	69.9	73.0	56.3	52.7	53.8	57.9	49.7	49.7	52.4	60.8	50.3	71.1	53.9	52.4	55.2	54.8	52.3	75.8
April.....	42.9	41.7	35.9	52.8	79.3	69.9	73.0	56.3	52.7	53.8	57.9	49.7	49.7	52.4	60.8	50.3	71.1	53.9	52.4	55.2	54.8	52.3	75.8
May.....	41.7	41.7	35.9	52.8	79.3	69.9	73.0	56.3	52.7	53.8	57.9	49.7	49.7	52.4	60.8	50.3	71.1	53.9	52.4	55.2	54.8	52.3	75.8
June.....	41.7	41.7	35.9	52.8	79.3	69.9	73.0	56.3	52.7	53.8	57.9	49.7	49.7	52.4	60.8	50.3	71.1	53.9	52.4	55.2	54.8	52.3	75.8
July.....	41.7	41.7	35.9	52.8	79.3	69.9	73.0	56.3	52.7	53.8	57.9	49.7	49.7	52.4	60.8	50.3	71.1	53.9	52.4	55.2	54.8	52.3	75.8
August.....	41.7	41.7	35.9	52.8	79.3	69.9	73.0	56.3	52.7	53.8	57.9	49.7	49.7	52.4	60.8	50.3	71.1	53.9	52.4	55.2	54.8	52.3	75.8
September.....	42.3	39.7	47.3	63.4	82.6	80.8	71.6	67.8	54.4	51.0	51.3	51.7	51.7	54.1	51.0	52.6	53.5	52.9	52.2	51.3	51.8	51.3	72.3
October.....	42.6	39.7	47.3	63.4	82.6	80.8	71.6	67.8	54.4	51.0	51.3	51.7	51.7	54.1	51.0	52.6	53.5	52.9	52.2	51.3	51.8	51.3	72.3
November.....	42.6	39.7	47.3	63.4	82.6	80.8	71.6	67.8	54.4	51.0	51.3	51.7	51.7	54.1	51.0	52.6	53.5	52.9	52.2	51.3	51.8	51.3	72.3
December.....	43.9	38.7	49.9	79.7	67.7	76.1	72.9	51.7	51.6	56.6	51.2	48.4	54.6	65.4	50.3	61.9	54.6	52.1	53.7	57.7	51.4	70.7	101.1

Stock 1st January.....	300m	300m	300m	450m	216m	138m	130m	90m	196m	340m	300m	460m	560m	660m	761m	760m	652m	510m	473m	508m	680m	675m	490m
Shipments.....	424m	452m	438m	603m	562m	524m	510m	527m	554m	533m	563m	583m	567m	607m	637m	679m	586m	565m	629m	620m	810m	841m	
Make.....	690m	770m	780m	700m	754m	823m	823m	920m	980m	980m	988m	1050m	1080m	1180m	1160m	1161m	994m	1031m	1368m	1170m	1366m	1160m	1020m
Furn. in blast 1 Jan.	113	105	111	113	114	115	121	131	123	131	134	131	131	125	131	134	136	98	112	121	139	136	126
Rail Deliveries.....	42.3	39.7	47.3	63.4	82.6	80.8	71.6	67.8	54.4	51.0	51.3	51.7	51.7	54.1	51.0	52.6	53.5	52.9	52.2	51.3	51.8	51.3	72.3
Consumption in Scot.	225m	250m	260m	305m	286m	300m	339m	315m	378m	340m	355m	348m	408m	531m	489m	531m	500m	430m	388m	447m	560m	465m	470m
Average Prices.....	44.6	40.1	45.3	61.5	79.9	79.9	72.6	69.2	54.5	51.1	53.8	49.3	53.7	55.9	57.4	54.9	60.6	53.6	52.2	53.4	54.4	58.1	101.1
Furn. in blast	92	110	100	112	116	116	117	128	129	125	131	133	130	127	131	133	112	108	114	124	130	137	127
Miners' Wages	2.9	2.6	3.7	3.9	5.4	4.4	4.3	4.7	3.7	3.7	3.6	3.6	3.6	3.6	3.6	4.7	5.6	4.9	3.9	3.9	4.7	4.6	7.3
Bank of Eng.	3	3	2 1/2	3 1/2	5	5	5 1/2	6 1/2	3	3 1/2	4 1/2	5 1/2	2 1/2	4 1/2	7	4 1/2	7	2 1/2	2	3	3	3	4
rate of discount.....	3	3	2 1/2	3 1/2	5	5	5 1/2	6 1/2	3	3 1/2	4 1/2	5 1/2	2 1/2	4 1/2	7	4 1/2	7	2 1/2	2	3	3	3	4

MONTHLY AVERAGE PRICES IN 1872.

January.....	71.7	April.....	92.7	July.....	122.7	October.....	120.9
February.....	75.8	May.....	95.1	August.....	126.2	November.....	97.6
March.....	85.8	June.....	99.7	September.....	129.3	December.....	104.7

AVERAGE, HIGHEST, LOWEST AND CLOSING PRICES OF 1871 AND 1872.

	Average.	Highest.*	Lowest.+	Closing.
1872.....	£5. 1/10	£6. 16/6	£3. 12/9	£6. 1/3
1871.....	£5. 1/10	£6. 16/6	£3. 12/9	£6. 1/3

*July 25th, 1872. +February 9th, 1872.

SCOTCH PIG IRON.

Annual Review for 1872, with Comparative Statistics.

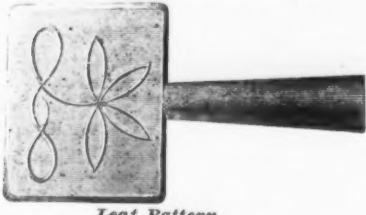
We compile the following from the Annual Circular of Messrs. James Watson & Co., Glasgow, and from other sources of information:

During the first six months of 1872, the demand from all parts of the commercial world remained extremely active, and continuing completely to exceed the supply, made serious inroads on stock; and, backed by a moderate amount of speculation, prices continued to advance steadily until toward the end of June the price of mixed numbers g. m. b. warrants stood about 100/ per ton. The stock of makers' iron having been largely dealt in during the earlier part of the year at comparatively moderate prices, had meantime been sensibly treasured upon, and the prices of this class of iron participated to a high degree in the current prosperity. About this time an increased spirit of speculation sprung up, and its main operations being conducted on systematic principles, chief amongst which, seemed to be the determination, by a body of operators, to secure possession of the entire stock of warrants, prices rapidly advanced, and within one month 137/ per ton was paid for these documents. During the succeeding two months the price of warrants continued to maintain a high level, fluctuating betwixt 135/ and 140/ and 150/. It now became evident that the extreme prices prevailing were having a detrimental effect on the demand; projected enterprises at home and abroad (Germany excepted) were being abandoned, and America, which had hitherto been one of the best customers for Scotch pig, ceased to draw supplies to any appreciable extent from the British markets. A stringent money market and financial difficulties amongst holders now began to exercise a prejudicial effect on the trade, and very quickly the price receded to 102/ 6 per ton. From this point, by recourse to a special speculative artifice, the price was in a very few days driven up to 132/ 6, being the figure demanded by the combination of holders, and at which existing open contracts were settled; the market then began to resume its natural position by a fall of 27/ per ton in two days, followed by a further gradual decline till 87/ 6 was reached, between which figure and 95/ a considerable legitimate business was done. Early in December there arose a difficulty with the colliers on the wages question, which has necessitated the "damping" of a number of furnaces, and thereby temporarily decreasing the production. Under the influence of this measure and the unwillingness of makers to enter into fresh engagements, there was considerable outside speculative buying, and warrants were dealt in up to 125/ per ton, closing at 121/ per ton. The average price for the year was 101/ 10 per ton.

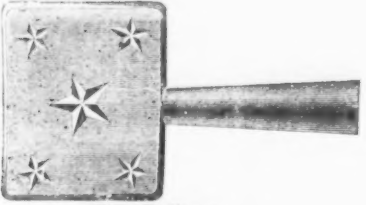
The production in 1872 was 1,000,000 tons against 1,160,000 tons in 1871, being a decrease of 160,000 tons

H. D. SMITH & CO., PLANTSVILLE, CONN.

Patent Embossed Steps.



Leaf Pattern.



Star Pattern.

King Bolt Yokes.

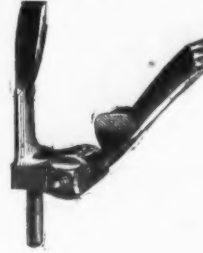


Established 1850.

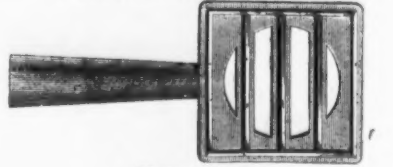
No. 6 Fifth Wheels.



1871 Pattern Shaft Couplings.



Patent Cross Bar Steps.

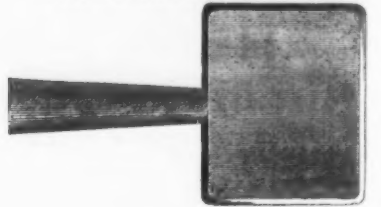


Upper View.

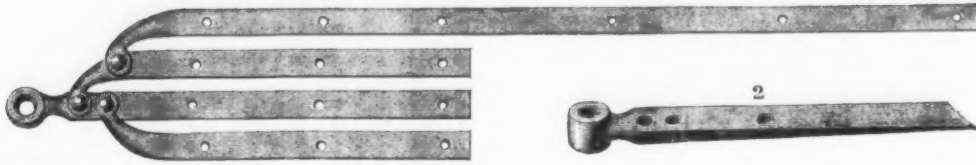


Lower View.

Solid Plain Pattern Steps.



Smith's Improved Philadelphia Pattern Slat Irons.



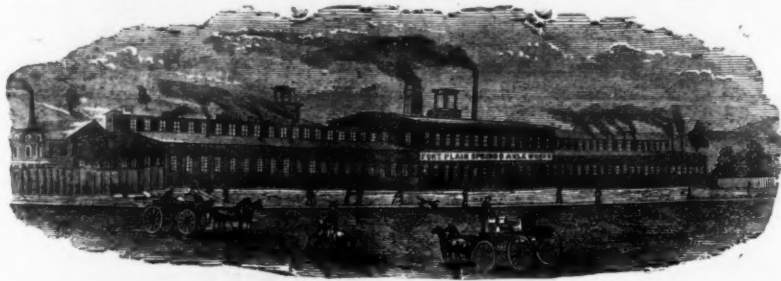
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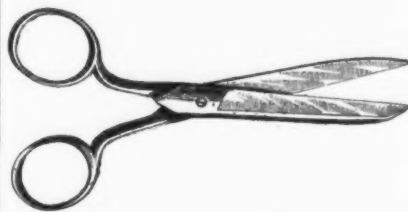
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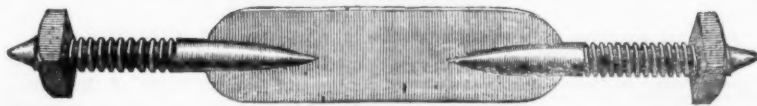
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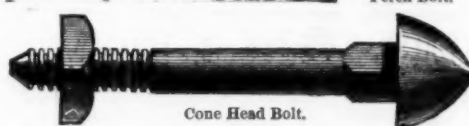
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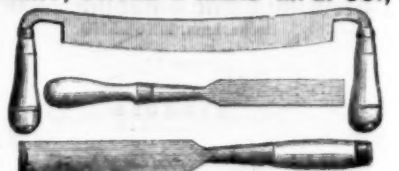
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Files, Importers of.	
Carr J. & Riley, 89 John, N. Y.	28
Dickinson Henry, 66 and 68 Reade, N. Y.	11
Fisher Joseph S., 411 Commerce, Phila.	11
Moss F. W., 80 John, N. Y.	28
Sanderson Bros. & Co., 16 Cliff, N. Y.	28
Spear & Jackson, 98 Chambers, N. Y.	22
Files, Manufacturers of.	
Barnett G. & H., 41 and 43 Richmond, Phila.	8
McCaffrey & Bro., 1723 & 1724 N. 4th, Phila.	8
Nicholson File Co., Providence, R. I.	8
Rothery John & William, 53 Chambers, N. Y.	11
Wheeler, Clemson & Co., Middletown, N. Y.	11
Fire Arms, Manufacturers of.	
Remington E. & Sons, Ilion, N. Y.	7
Schuyler & Daly, 84 Chambers, N. Y.	7
Great Western Gun Works, Pittsburgh.	7
Parker Bros., West Meriden, Conn.	7
Fire Brick, Importers of.	
Hammill & Gillespie, 240 and 242 Front, N. Y.	6
Fire Brick, Makers of.	
Bowman O. O. & Co., Trenton, N. J.	6
Evans & Howard, 915 Market, St. Louis, Mo.	6
Hall A. & Sons, Perth Amboy, N. J.	6
Kreischer B., 58 Goerck, N. Y.	6
Newkumet Philip, 23rd and Vine, Phila.	6
Palmer, Newton & Co., Albany, N. Y.	6
Watson John R., Perth Amboy, N. J.	6
Fire Department Supplies, Mfrs. of.	
Allen Albert F., Providence, R. I.	9
Felt, Salamander, Manufacturers of.	
U. S. & Foreign Salt Felt Co., Troy, N. Y.	31
Gage Cocks & Dampers, Regulators.	
Murphy & Kelzer, Baltimore, Md.	31
Galvanized Iron.	
Leferts Marshall Jr., 94 Beekman, N. Y.	4
Gate Hinges, self closing, Makers of.	
Clark & Co., Buffalo, N. Y.	22
Glass, Importers of.	
Downing A. C. & Co., 87 Beekman, N. Y.	13
Governors, Mfrs. of.	
Lynde J. D., Philadelphia, Pa.	31
Grindstones.	
McDermott J. & Co., Cleveland, O.	29
Wood Walter R. & Co., 283 and 285 Front, N. Y.	29
Grist Mills (portable), Makers of.	
Leonard & Sullivan, Bridgeport, Conn.	25
Gunpowder, Makers of.	
Kneeland F. L. (DuPont) 70 Wall, N. Y.	28
Laflin & Rand Powder Co., 21 Park Row, N. Y.	28
Hammers, etc., Manufacturers of.	
Industry Mfg. Co., 79 Reade, N. Y.	9
Nelson Tool Works, 157 E. 23d, N. Y.	9
Handles, Makers of.	
Smith, J. W. H. & Co., Charlotte, Mich.	8
Hardware Auctioneer.	
R. T. Hazell & Co., 118 Chambers, N. Y.	15
Hardware, Brass and Galvanized.	
Tiebout W. & J., 290 Pearl, N. Y.	2
Hardware, Commission Merchants.	
Fernald & Sile, 31 Beekman, N. Y.	8
Gerzabek O. V., San Francisco, Cal.	8
Green R. M. & Co., 100 Chambers, N. Y.	12
Graham & Haines, 88 Chambers, N. Y.	26
Halsey J. E., 75 Reade, N. Y.	8
Jewett & Roberts, 122 Chambers, N. Y.	22
Walbridge Geo. B., 55 Chambers, N. Y.	22
Hardware Dealers.	
Brower J. I. & Co., 288 Greenwich, N. Y.	22
Finney Thos. L. & Co., Vicksburg, Miss.	25
Hubbard & Curtis Mfg. Co., 89 Chambers, N. Y.	21
Lloyd, Supplies & Wm., 823 Market, Phila.	22
Shepard Sidney & Co., Buffalo, N. Y.	21
Turner, Seymour & Judds, 64 Duane, N. Y.	8
Walsh, Coulter & Flagler, 83 Chambers, N. Y.	10
Hardware Importers.	
Beam & Murray, 54 Cliff, N. Y.	22
Baker Herman & Co., 101 Duane, N. Y.	22
Field Alfred & Co., 47 John, N. Y.	21
King H. & J. W., 80 Chambers, N. Y.	11
Prith, 16 Cliff, N. Y.	21
Van Wart & McCoy, 43 Chambers, N. Y.	21
Turner R. A., 37 Chambers, N. Y.	21
Wiebusch F., 54 Chambers, N. Y.	22
Hardware Manufacturers.	
Biddle Mfg. Co., 78 Chambers, N. Y.	22
Enterprise Mfg. Co., Phila.	26
Hart, Bliven & Mead Mfg. Co., 243 Pearl, N. Y.	12
Hubbard & Curtis Mfg. Co., 89 Chambers, N. Y.	21
Kellogg Wm. P. & Co., Troy, N. Y.	7
Lane, Gale & Co., Troy, N. Y.	7
Many F. L. & Marshall, 48 Warren, N. Y.	9
Middleton Tool Co., 82 Chambers, N. Y.	21
Miller's Falls Mfg. Co., 78 Beekman, N. Y.	21
Moorhead, Adams & Co., Pittsburgh, Pa.	32
Pratt & Co., Buffalo, N. Y.	22
Providence Tool Co., 11 Warren, N. Y.	14
Ripley Mfg. Co., Unionville, Conn.	14
Russell & Erwin Mfg. Co., 45 Chambers, N. Y.	8
Skinner & Cooley, Watkins, N. Y.	14
Shattuck W. F. & Co., 113 Chambers, N. Y.	14
Stanley Works, 58 Beekman, N. Y.	24
Taylor Mfg. Co., New Britain, Conn.	22
Union Mfg. Co., 55 Chambers, N. Y.	26
Williams, White & Churchill, 78 Warren, N. Y.	12
Wilson Mfg. Co., 87 Chambers, N. Y.	12
Hardware Specialties.	
Biddle Mfg. Co., 78 Chambers, N. Y.	22
Simple, Birge & Co., St. Louis.	32
Hoes, Makers of.	
Peters Bros. Mfg. Co., Marshall, Mich.	14
Hoisting Engines, Makers of.	
Morris Co. Mch. and Iron Co., 36 Cortlandt, N. Y.	30
Otis Bros. & Co., 345 Broadway, N. Y.	9
Horse Nails, Makers of.	
Anable Horse Nail Co., 35 Chambers, N. Y.	32
Brundage & Co., Middletown, N. Y.	32
Globe Nail Co., Boston, Mass.	32
Pratt & Co., Buffalo, N. Y.	22
Horse Shoes, Makers of.	
Burden Iron Works, Troy, N. Y.	6
Hubs and Spokes, Mfrs. of.	
Gleason, J., 2nd and Diamond, Phila.	12
Insurance, Boiler.	
Hartford Steam Boiler and Inspection Co.	34
Iron Brokers.	
Boyd Geo. A., 70 Wall, N. Y.	4
Hazard & Jones, 213 Pearl, N. Y.	4
Pettit Wm. M., 72 Wall, N. Y.	4
Iron, Charcoal, Warm or cold blast.	
Quincy John W., 98 William, N. Y.	4
Iron Commission Merchants.	
Blackston & Cox, 333 Walnut, Phila.	15
Hand Jas. C. & Co., 614 & 616 Market, Phila.	15
Malin Bros., 228 Dock, Phila.	6
Iron, Pig, Importers of.	
Williamson James & Co., 69 Wall, N. Y.	4
Iron Dealers.	
Abel Brothers, 190 South, N. Y.	4
Bigelow & Johnson, 45 Pine, N. Y.	4
Bonnell, Botsford & Co., Youngstown, O.	4
Borden & Lovell, 70 & 71 West, N. Y.	4
Buchanan Geo., 19 Birch Lane, London, E. C.	4
Cleveland Brown & Co., Cleveland, O.	4
Coddington T. B. & Co., 25 Cliff, N. Y.	4
Conklin & Huerstel, 99 Market Slip, N. Y.	4
Davidge & Wheeler, 75 Pine, N. Y.	4
Fuller, Lord & Co., 125 Greenwich, N. Y.	4
Fuller, Dana & Fitz, 110 North, Boston.	4
Gardner Wm., 575 Grand, N. Y.	4
Hall, Kimbark & Co., Chicago.	4
Harrison & Gilloon, 536 to 538 Water, N. Y.	4
Jackson & Chase, 266 and 268 Franklin, N. Y.	4
Judson B. F., 437 and 439 Water, N. Y.	4
Matthews Chas. W., 123 Walnut, Phila.	4
Packard, Goff & Co., Youngstown, O.	4
Piersons & Co., 24 Broadway, N. Y.	4
Pope Thos. J. & Bro., 222 Pearl, N. Y.	4
Richards D. W. & Co., 82 Mangin St., N. Y.	4
Swan John E. & Bros., Glasgow, Scotland.	4
Smith Gam'l G. & Co., 342 Pearl, N. Y.	4
Warner A. B. & Son, 28 & 29 West, N. Y.	4

Whitney James & Co., 69 Wall, N. Y.	4
Whitney Alfred R., 55 Hudson, N. Y.	4
Iron, Manufacturers of.	
Atwater, Wheeler & Co., New Haven, Conn.	6
Burden Iron Works, Troy, N. Y.	6
Cartwright, M. & Co., Cleveland, O.	6
Cleveland Rolling Mill Co., Cleveland, O.	6
Coffin Wm. E. & Co., 8 Oliver, Boston.	4
Elizabeth Iron Co., Elizabethport, N. J.	6
Ellis W. R. & Co., 17 Battery March, Boston.	4
Everson, Graft & Macrum, Pittsburgh, Pa.	4
Fulton S. & Co., 412 Walnut, Phila.	6
Jones & Laughlin, Pittsburgh, Pa.	4
Leonard John, 450 & 451 West St., N. Y.	4
Milwaukee Iron Co., Milwaukee, Wis.	4
Niles Iron Co., Niles, O.	4
New Haven Rolling Mill Co., New Haven, Ct.	4
Old Dominion Iron and Nail Works Co., Richmond, Va.	6
Oxford Iron Co., 81 Washington, N. Y.	4
Phoenix Iron Co., 410 Walnut, Phila.	6
Rowland, Wm. & Harvey, Phila.	32
Iron, Hoop, Manufacturers of.	
Wm. Clark & Co., Pittsburgh, Pa.	4
Iron, Sheet, Manufacturers of.	
Reese & Co., Pittsburgh, Pa.	4
Iron, Swedish, Importers of.	
Jessop Wm. & Sons, 91 and 99 John, N. Y.	28
Mittler Nils, 69 William, N. Y.	28
Page Ewd. & Co., Boston, N. Y. and Phila.	4
Lace Leather, Manufacturers of.	
Coupe Wm. & Co., S. Attleboro' Mass.	12
Lanterns, Manufacturers of.	
Howard & Morse, 45 Fulton, N. Y.	2
Taylor Mfg. Co., New Britain, Conn.	21
Lawn Mowers, Manufacturers of.	
Barlow & Walker, Sing Sing, N. Y.	15
Chadborn & Coldwell Mfg. Co., Newburgh, N. Y.	25
Hill's Archimedean Lawn Mower Co., Hartford, Ct.	15
Lead and Tin Lined Lead Pipe, etc., Mfrs.	
Colwell, Shaw & W. Mfg. Co., 213 Centre, N. Y.	2
Locks, Manufacturers of.	
Norwich Lock Co., Norwich, Conn.	22
Romer & Co., Newark, N. J.	22
Sargent & Greenleaf, 55 Chambers, N. Y.	22
Trenton Lock Co., 48 Warren, N. Y.	9
Yale Lock Mfg. Co., 1 Barclay, N. Y.	22
Machinery, Makers of.	
Fishkill Landing Mch. Co., 63 Bleeker, N. Y.	20
Greene D. A., 336 & 338 Delancy, N. Y.	20
Mason V. W. & Co., Providence, R. I.	31
Morris Co. Machine and Iron Co., Dover, N. J.	30
Chapin Machine Co., New Hartford, Conn.	30
Pratt & Whitney Co., Hartford, Conn.	30
Stiles & Parker Press Co., Middletown, Ct.	31
Watson Andrew, 337 Dickinson, Phila.	31
Machine Services, Makers of.	
Lyons & Fellows Mfg. Co., Williamsburg, N. Y.	20
Machinists' Tools, Makers of.	
Blaisdell F. & Co., Worcester, Mass.	31
Harrington Edwin, 15th St. & Pa. Ave., Phila.	31
Malleable Iron Castings, Makers of.	
Barnett Oscar, Newark.	2
Tower Daniel L., Elizabethport, N. J.	6
Meat Cutters, Makers of.	
Whittemore D. H., Worcester, Mass.	24
Metal Dealers and Brokers.	
Belknap Ang. & Co., Beckman, N. Y.	2
Crane A. C., 104 John, N. Y.	2
Conington R. B., 2nd St. & 2d Cliff, N. Y.	2
Harrick Max, 55 Beaver, N. Y.	2
Phelps, Dodge & Co., Cliff, N. Y.	2
Pope Thos. J. & Bro., 292 Park, N. Y.	2
Thompson A. W., 32 City, N. Y.	2
Thompson A. A. & Co., 218 and 215 Water, N. Y.	2
Van Wart & McCoy, 43 Chambers, N. Y.	2
Metalurgists.	
Brown J., Blodgett, 399 Walnut, Phila.	14
Dutton & Corlies, 1129 Grand, Phila.	14
Edwards R. B., 12th St. & 2d Cliff, N. Y.	14
Henderson James, 30 Broadway, N. Y.	14
Maynard & Van Rensselaer, 24 Cliff, N. Y.	14
School of Mines, E. 49, N. Y.	14
Mining and Railroad Tools, &c., Makers of.	
Washoe Tool Mfg. Co., 61 Park Place, N. Y.	9
Molder's Tools.	
Carter H. & Sons, 990 Pearl, N. Y.	32
Needle and Reeler Knives, Makers of.	
Simond's Mfg. Co., Fitchburg, Mass.	2
Monuments, Granite and Bronze.	
National Fine Art Foundry, 318 E. 25th, N. Y.	7
Morse Traps, Makers of.	
Dietz R. E., 54 & 56 Fulton, N. Y.	32
Nickel Plates.	
Smith L. L. & J. T., 133 & 135 W. 25th St., N. Y.	14
Smith L. A., 42 Mechanic St., Newark, N. J.	14
Norway Shapes, Rollers of.	
Rowland Wm. & Harvey, 948 Beach, Phila.	32
Note Broker.	
Gallandet P. W., 3 and 5 Wall, N. Y.	2
Nuts, Bolts, etc., Manufacturers of.	
Easton & Co., Middletown, Conn.	14
Am. Rolled Nut & Tube Co., Richmond, Va.	14
Arms, Bell & Co., Youngstown, O.	14
Clark Bros & Co., Middale, Conn.	12
Fallier, Lord & Co., Boonton, N. J.	14
Franklin & Co., 100 E. 10th St., N. Y.	2
Lewis, Oliver & Phillips, Ave. D & 11th, N. Y.	14
N. Y. Screw Bolt Works, Ave. D & 11th, N. Y.	14
Plumb, Burdick & Barnard, Buffalo, N. Y.	32
Rhode Island Nut Co., 11 Warren, N. Y.	32
Stevens J. H., Reading, Pa.	32
Oilers, Makers of.	
White J. H., Newark, N. J.	32
Ore Crushing Machinery, Makers of.	
Blake Crusher Co.	2
Paints and Oils, Dealers in.	
Devos F. W. & Co., 117 Fulton, N. Y.	2
N. Y. Enamel Paint Co., 43 Chambers, N. Y.	20
Paper Dealers.	
Hart Melvin & Son, 44 Beekman, N. Y.	21
Paper and Book Binders.	
Howson & Son, Phila., and Washington, D. C.	25
Whitney J. A., 126 Broadway, N. Y.	2
Picture Nails, etc., Manufacturers of.	
Richards T. C. & Co., 47 Murray, N. Y.	2
Pipes, Fittings, etc., Makers of.	
Eaton & Cole, 58 John, N. Y.	20
McNab & Harlin, 30 E. 10th St., N. Y.	20
N. Y. Finkel & Co., 130 E. 10th St., N. Y.	20
Pancoat & Manie, 227 Pearl, Phila.	20
Chas. Gregg Mfg. Co., 62 & 64 Gold, N. Y.	20
Pipe, Water and Gas, Makers of.	
Brick E. A. & Co., 89 White, N. Y.	6
Graft William & Co., Pittsburgh, Pa.	4
Gray Jess. W. & Sons, Camden, N. J.	4
Warren Foundry & Mch. Co., Phillipsburg, N. J.	6
Wood R. D. & Co., 173 Broadway, N. Y.	4
Plane Irons, Manufacturers of.	
Middletown Tool Co., Middletown, Conn.	30
Sandusky Tool Co., Sandusky, O.	30
Planes, Manufacturers of.	
Sandusky Tool Co., Sandusky, O.	30
Stanley Rule & Level Co., 55 Chambers, N. Y.	14
Plumbing Lubricator.	
N. Y. Black Lead Works, 173 Forester, N. Y.	2
Plumbers' Materials, Manufacturers of.	
Car Wm. S. & Co., 106 Centre, N. Y.	2
Presses, Power, Makers of.	
The Stiles & Parker Press Co., Middletown, Ct.	3
Pressure Blowers, Makers of.	
Sturtevant B. F., 79 Sudbury, Boston.	12
Printing Presses, Makers of.	
Woods Benj. O., 351 Federal, Boston.	12
Printers and Engravers' Depot.	
Van Buren, Wells & Co., 110 Fulton, N. Y.	31
Publishers.	
Burr & Hyde, Hartford, Conn.	20
Pumps, Makers of.	
Douglas W. & B., Middletown, Conn.	20
Rumsey & Co., Seneca Falls, N. Y.	20
Union Mfg. Co., 55 Chambers, N. Y.	20
Van Buren, Wells & Co., 110 Fulton, Mass.	20
Rails, Importers of.	
Congreve Chas. & Son, 104 and 106 John, N. Y.	26
Hopkins S. W. & Co., 57 Broadway, N. Y.	4
Naylor & Co., 99 John, N. Y.	4
Smith Gilead A. & Co., 63 Broadway, N. Y.	4
Rails, Iron or Steel, Makers of.	
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Cambria Iron Co., Johnstown, Pa.	26
Cleveland Rolling Mill Co., Cleveland, O.	26
Griewold John A. & Co., Troy, N. Y.	26
Springfield Iron Co., Springfield, Ill.	26
Union Iron Steel Co., Joliet, Ill.	26
Razor Scraps, Makers of.	
B. F. Badger, 51 Elm, Charlestown, Mass.	26
Rock Drills, Makers of.	
Barleigh Rock Drill Co., Pittsburg, Mass.	26
Chapin Machine Co., New Hartford, Conn.	26
Moore James, Cor. 16th & Buttonwood, Phila.	26
Rolls, Chilled and Sand, Makers of.	
Garrison A. & Co., Pittsburg, Pa.	26

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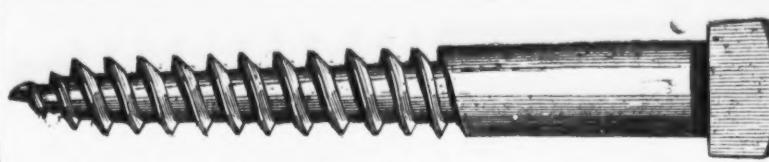
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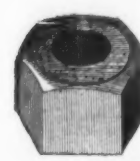
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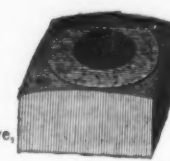
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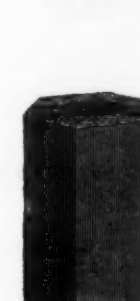
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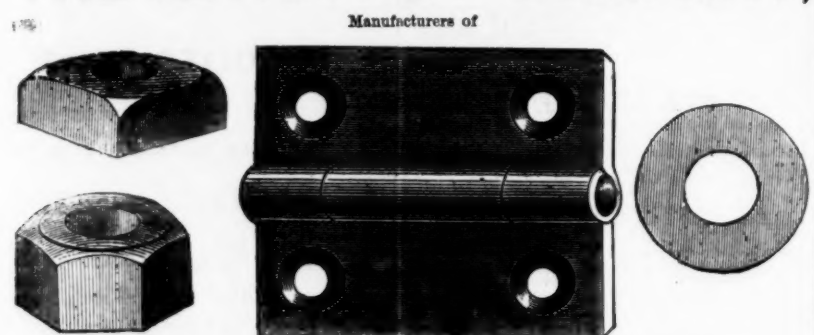
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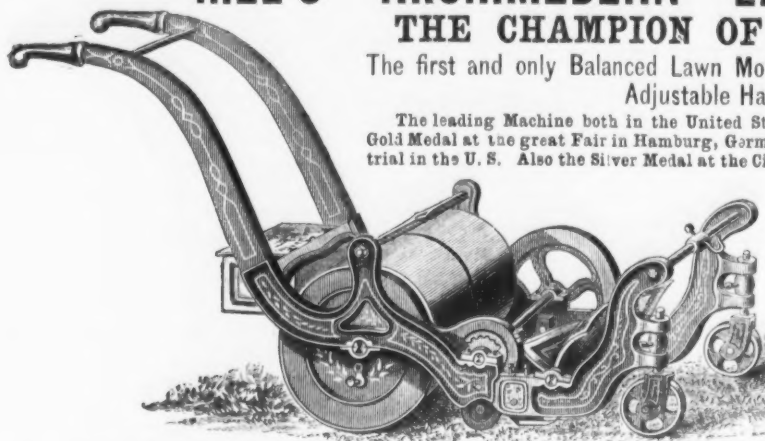
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10 inch Croquet Mower, for Miss, \$20.00. 14 inch, for Man, \$25.00.
12 inch, for Boy, 22.00. 28 inch, for Pony, 100.00.
32 inch, for one Horse, \$125.00.

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The Brooklyn Committee of Fifty has prepared a review of the three reports recently made by committees of the East River bridge directory on the management of the work. They claim, in part, that the majority report shows that Superintendent Kingsley had been overpaid on Jan. 1, 1871, \$116,000, and that he has virtually a dangerous control of the Company's funds. The minority report shows, the committee further claims, that, to hide certain transactions of Kingsley and Keeney in bridge stock, erasures had been made in the check book, ledger and minute book, and that, in estimating the cost of the bridge at \$9,500,000 or \$10,000,000, the great additional cost of anchorages and approaches had not been ascertained. The Committee of Fifty removes the credit of the undertaking from Kingsley to John A. Roebbling and his son and successor, as chief engineer, Washington A. Roebbling, who has received \$10,000 a year salary, while Kingsley's compensation was for over two years and nine months at the rate of \$45,000 per annum.

The American Fork Railway (narrow gauge) has probably the heaviest grade of any in this country. The road is constructed sixteen miles from the terminus, at American Fork, to Deer Creek, and within six miles of smelting works, and within one and three fourth miles of the famous Miller mine. The elevation of the smelting works above the junction of the road with U. S. R. is 2684 feet, which has to be obtained in nineteen miles. The heaviest grade, within the first four miles, reaches 307 feet to the mile.

There has been a large vein of fire clay discovered near the Alton Junction. It is twenty-two feet thick and very near the surface. Chemists state that it is as good as the famous Christie Clay, of St. Louis, if not better. A St. Louis firm have leased it, and propose making fire brick and other articles usually made from fire clay.

It has been ascertained, by sinking a shaft to the depth of 300 feet at its border, that the great Oklawaha Swamp, in Southern Georgia, is underlaid with a bed of bituminous coal. This swamp is a thickly timbered morass, about two hundred miles in circumference, and the project has been conceived of draining it.

Iron bolts in wooden structures are always attacked by rust, which diminishes their size and loosens their hold. A simple remedy is now discovered. Bolt holes are coated with a mixture of zinc filings and grease. The iron is thus galvanized and preserved from oxidation. It is a French invention.

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1873.

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T. J. Turley, Franklin, Tenn., writes Nov. 6th, 1872.—Some months ago I purchased one of your Duodecimo Novelty Presses, and I am happy to say that it works admirably and far exceeds my most sanguine expectations in the manner it does its work.

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Oscar F. Black, Vergennes, Vt., writes Dec. 16th, 1872.—My Novelty works splendidly.

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J. A. Morrill, Fulton, N. Y., writes Nov. 25th, 1872.—The Duodecimo Novelty Press which I purchased about two weeks ago works splendidly; cards printed on it seem as fine as engraved.

Geo. W. Bickel, Ripley, O., writes Sept. 16th, 1872.—I have given the Octavo Novelty Press, which I bought of you about one month ago, a fair test with a chase full of type, and I like it better than ever.

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Square Groove Noiseless Pulleys, 3 inch....."	3 38
Square Groove Noiseless Pulleys, 3½ inch....."	4 75
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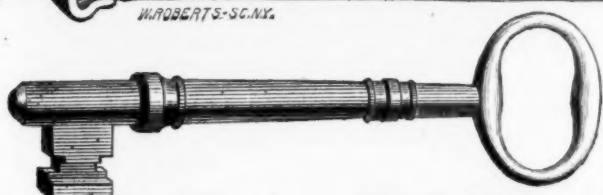
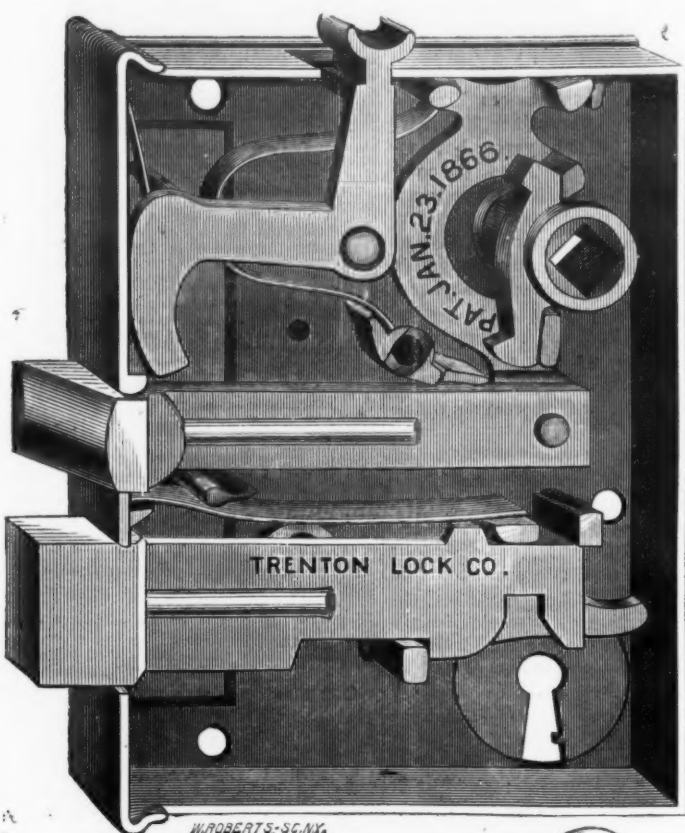
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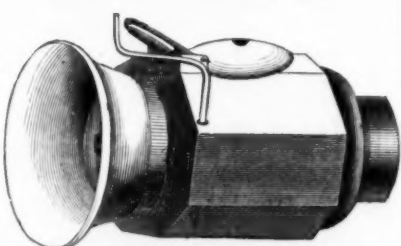
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The most simple and easy
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All who need a Lawn Mower, either for a small or large Lawn, should examine the merits of Walker's Patents, **Empire** and **Monitor**. They are simple in construction and very light, not fatiguing the operator.

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The Iron Age.

New York, Thursday, February 13, 1873.

DAVID WILLIAMS . . . Publisher and Proprietor.
JAMES C. BAYLES . . . Editor.
JOHN S. KING . . . Business Manager.

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The British Iron Exports.

The Board of Trade Returns of British exports of iron and manufactures of iron, for the calendar year 1872, elsewhere published in this issue, will be found of unusual statistical interest. As was expected, the figures for 1872 show a small increase over those for 1871. The total quantity of iron and steel exported during 1872 amounted to 3,388,622 tons, of the declared value of £36,060,547, against 3,169,219 tons, of the value of £26,124,134 in 1871, showing an increase in quantity of 219,403 tons, and in value of about ten millions sterling. Turning to particulars, we find exported in 1872, 275,268 tons of pig iron more than in 1871, while the increase in value of the total export was more than doubled. For pig iron the principal customers were Holland and Germany. Of bar, angle, bolt, and rod, there were exported 35,200 tons less than in 1871; but the increase in value over that year amounted to £713,781. Italy, Turkey, British India, and other countries show a falling off; but from the principal markets there was no diminution in the demand. Of railroad iron of all sorts there were exported less by 33,649 tons than in 1871, though the increase in value amounts to over £2,163,000. Wire of iron or steel (except telegraph wire), whether galvanized or not, shows an increase of 7405 tons, and £228,584 over the previous year. Of hoops, sheets, and boiler and armor plates, there were exported during 1872, 8086 tons less than during 1871, but there was an increase in the value of the total export of £1,031,767 over the value of the export of 1871. In cast or wrought there was an increase in quantity of 26,316 tons, and in value of £1,190,421. There are increases of greater or less extent to all the countries enumerated except British India, where the demand for material coming under this head has been, as in railroad iron, considerably less throughout the year. In the exports of old iron there is a decrease in both quantity and value, but of unwrought steel the exports of 1872 exceeded those of 1871 by more than 6000 tons, with an increase in total value of about £30,000.

This looks very prosperous, and is accepted by our British exchanges as a satisfactory showing; but there is every reason to believe that, with no decrease in the foreign demand, the exports for 1873 will make but a poor showing as compared with those above given. That the total increase in 1872 over 1871 was less than 220,000 tons, with a foreign demand so active as to run prices up to figures seldom, or never, before attained, shows that the productive capacity of this country does not admit of expansion beyond certain definite limits, which, we believe, have been reached and receded from. To make up the exports of the year to the totals shown in the returns, stocks have been reduced to almost nothing. For example, while the make of Scotch pig iron in 1872 exceeded that in 1871 by 51,000 tons, the stocks held at the close of 1872 show a reduction of 245,000 tons, as compared with those held at the close of 1871. Again, the make of pig iron in the North of England is officially stated at 1,968,972 tons in 1872 and 1,864,239 tons in 1871, an increase of 84,000 tons, while the comparison of stocks is as follows:

	Dec. 31, 1872.	Dec. 31, 1871.
Tons.	Tons.	Tons.
In makers' hands	40,697	68,601
Warrants	991	2,730
Total	41,688	68,331
Loss in 1872		26,708 tons.

Here we have a decrease in the stocks of Scotch and Cleveland pig iron alone of 271,703 tons, or nearly 52,000 tons more than the total increase in the exports of all forms of iron and steel. Were it possible to give any other comparisons of stocks at this time, it would doubtless be found that, allowing a larger percentage for increase in home consumption than is probable, considering the economy observed in the use of any commodity when prices are far above the averages of former years, there has been a decided falling off in the production of British iron. At all events, it is evident that pretty much all the iron in the country has been worked up and exported or manufactured for home consumption, and the opening of the year finds the British markets bare of stocks, with coal higher than in 1872, and still advancing, with ores, domestic and foreign, in insufficient supply, and with nearly 100,000 colliers and iron workers out on strike for higher wages, or idle because of the strikes of those upon whose labor they are dependent for supplies of raw materials.

Nor is the outlook more encouraging than the situation. With the wages question settled to the entire satisfaction of employers, the coal output would be limited and costly, owing to the increasing difficulty of working the mines, and the ore supply would be far short of the requirements of the country. The fact, mentioned by Mr. David Forbes, in his interesting paper on the iron industries of Europe, that the contracts for Spanish ores for export to Great Britain greatly exceed the amount which it is possible to ship with present facilities, is significant of the condition of the British ore market. Upon what, then, is Great Britain to depend for the maintenance of her iron industries? Last year her exports were maintained by shipments of accumulated stocks. How will it be this year, with no stocks to draw upon and raw materials in insufficient supply? Statisticians may estimate a full supply of coal for a century to come, but the mine owners are not going to work out their pits at low prices for the public good, and iron ores from abroad are, at best, a precarious dependence, especially where they come from a country tottering on the brink of bloody revolution, and in which the Carlist movement is assuming proportions more formidable than it has ever before attained, while a republic has been declared before King Amadeus has fairly abdicated his uncomfortable throne. We may give undue weight to the dangers which have overtaken, or which threaten, the iron production of Great Britain, but with the information now in our possession, and after careful examination of the most favorable productions which those interested have found courage to venture, we cannot escape the conviction that a crisis in English affairs is imminent, and that another year will show, in diminished exports, and a correspondingly increased production in other countries hitherto drawing largely upon British markets, that England is losing ground, and that, with the growth of the iron industries of this country, we need fear no serious competition from that quarter in our effort to build up a great and growing export trade in American iron and its manufactures.

Capital on the Defensive.

We learn from Baltimore that five of the principal firms of that city engaged in the manufacture of boots and shoes, have signed and published a card, of which the following is the substance:

Resolved, That we will not allow ourselves to be ruled by any organization whatsoever, and shall employ any hands we see fit.

This is brief, and to the point. It gives full and fair notice to the workmen, individually and as members of trade unions, that the signers of the resolution will tolerate no interference with the management of their business; that henceforth industry and skill, and not membership of a trade union and the possession of a "working card" from some irresponsible committee, are the qualifications which those must possess who seek employment in their establishments; and that those who do not like the arrangement can either accept it or seek employment elsewhere. If this declaration is made in good faith, and with a determination on the part of the signers to support each other in resisting any attempted interference on the part of the unions with themselves or their employees, their action is to be commended and their example followed. If, on the other hand, the resolution is intended merely as an attempt to frighten the unions, without representing a settled purpose to make good the declaration, the men will not be long in finding it out and in making good use of the discovery.

We have long held, and frequently expressed, the opinion that the success of the trades unions is due solely to the fact that they have nowhere encountered organized and determined resistance. Capital is notoriously cowardly and selfish. It is easily frightened by a formidable demonstration which threatens a diminution of current profits upon investments, and, as the rule, always ready to seize a present and momentary advantage, without regard to the future consequences of such a policy. Manufacturers engaged in a common trade are very ready to meet and discuss matters of mutual interest, but they rarely keep faith with each other when they can make a profit by breaking their agreements. We do not say that this applies to all manufacturers, but it certainly applies to all trades; and however complete may be the organization of employers to secure a common benefit, there are always some who will betray their associates, and generally enough of these to materially weaken, if not to render wholly useless, any resistance which others may offer to the despotic rule of the unions. Among the workmen no such weakness of purpose is noticeable. They make common cause, keep faith with each other, sustain each other in aggressive or defensive movements, and suffer serious privation rather than betray the unions by accepting employers' terms. When was such unanimity of purpose or harmony of action ever displayed by employers? During strikes and suspensions, those who are earning wages contribute to the support of those who are idle, and money is often sent from distant sections, with expressions of sympathy and encouragement, to aid in sustaining strikes. When were employers in one state or locality ever known to express even a friendly interest in the issue of a conflict with the unions in another state or locality, or to tender pecuniary assistance to such as might need it to enable them to maintain a successful resistance to unreasonable and improper demands which, if granted in one branch of the trade, must, sooner or later, be granted in all? This is why the unions, with occasional temporary checks, have gradually but surely gained a practical control of four-fifths of our productive industries, and why employers find themselves unable to regain what they have, for want of organized resistance in times past, been forced to surrender. To save itself from the loss of petty temporary profits, capital has voluntarily put its neck under the heel of the trade unions, and there it will remain until it gains a courage from the teachings of experience that will enable it to sacrifice a present unimportant advantage for a great and permanent good.

We speak plainly upon this subject, because it is time the fact was fully understood that individual employers are practically powerless to resist the aggressions of organized labor, and that unless the former are prepared to make common cause for their own protection, they have only themselves to blame if the unions wrest from them the control of their business, force them to employ whoever may be sent them, and absorb for labor all the profits of production, until their capital is wasted in making good annual losses, instead of augmented by annual accumulations of interest. While we have found by experience that organized labor can easily overcome such resistance as individual employers may offer in defending the rights of capital, we have also found that, with organization, capital is potent to resist the most formidable movements. The defeat of the eight-hour strikes of last year in this city, where the issue was raised and decided for the whole country, shows what can be done when employers are fully aroused to a sense of impending danger. In this case it was a question of momentous interest to capital, and there was organization sufficiently perfect, and enough employers to keep faith with each other, to defeat the strongest

movement ever started by the unions, and to save the country from a loss of 20 per cent. in the amount, and an increase of 25 per cent. in the cost, of its annual production of useful commodities. Unless employers are prepared to protect not only themselves, but each other, against the encroachments of the unions, and, while allowing labor a fair and equitable share of the profits of production, to resist firmly and without compromise all attempts to deprive capital of the right to manage its own interests, there is nothing to save the American labor market from becoming, in time, as hopelessly and utterly demoralized as is that of Great Britain, which can only be restored to order by a sweeping commercial crisis that shall shake, if not destroy, the very foundation of the country's prosperity.

New Railway Facilities for the Superior Iron Region.

The Chicago and Northwestern Railway Company have lately completed and put in running order an extension of their "Peninsular Division," between Escanaba and Menominee. This extension is sixty miles long; and it would be difficult to name a part of the country of equal distance where a railway was more needed, for either passenger or freight traffic. The Chicago and Northwestern Branch, between Chicago and Menominee, 292 miles, had been finished for some years; but passengers and freights, previous to the completion of the extension, had to be transferred to and from steamboats at Escanaba or Menominee, according to their northward or southward point of destination. This fact very frequently caused annoyance, delay and expense—annoyance to passengers for the Lake Superior iron region, by obliging them to make a steamer trip, often boisterous, for sixty miles on Green Bay; delay on account of weather which rendered it unsafe for a vessel to put to sea, and expense, by reason of the rate of wages paid to laborers for transshipping goods twice within sixty miles—a rate frequently as high as \$3.50 per day for deck hands. In addition to these facts, it should be noted that, between the middle of May and the middle of November, the Superior iron region was a sealed locality to any but the most venturesome travelers until the completion of the new extension. During fully five months of the year that country is inaccessible by water; and for that period all the ore taken from the mines must be piled up to await the opening of navigation; and it thus rests, for so much time, as dead stock in the hands of its producers. Then, when shipping is resumed, the mass of ore to be removed is so vast that a month of the hardest work on the largest scale is required to get the accumulated stock fairly on its way to market. These facts demonstrate that for seven months of the year the facilities for transporting the ore of this region are wholly out of proportion to its producing capacity. As an instance of the evils resulting from inadequate transportation facilities, it may be mentioned that while the furnace owners of the West are suffering for want of more abundant and cheaper ores from the Lake Superior country, the furnace owners at Lake Superior are in great distress for want of Western coal, for lack of which several large stacks are said to have been blown out during the past few weeks.

The opening of the new extension will effect something during this season, and much more during future winters, in facilitating the movement of ores to the furnaces. It is, of course, very improbable, if not impossible, that the price of iron will ever be so high as to render it profitable to transport the Superior ores as far eastward as Wyandotte or Cleveland by rail, especially during the season when nature stops the steamboat competition; but some of the winter surplus of ore may, by the aid of the new road, find its way to Green Bay and Appleton, Wisconsin, where are large smelting furnaces. Then, again, by enlarging the facilities for moving freights in winter, a greater number of business men will find it profitable to visit that section during the cold season, and thereby the railroad organizations will augment their passenger travel—that is, provided the Chicago & Northwestern and the Marquette, Houghton & Ontonagon railway companies should ever condescend to bestow any attention on the passenger business of those portions of their roads over which the ore traffic is heavy.

Before taking leave of this subject, it may be proper to remark that railroad enterprises having a well-defined form are contemplated for the opening of a section of iron country distant between twenty and forty miles from Escanaba, a section believed to be rich in hematite ores that will yield 62½ per cent. of iron in the furnace. We have recently obtained much interesting information on this subject, but the facts would occupy too much space to allow of their embodiment in this article.

Duties on Ship-Building Materials.

The manufacturers of copper and yellow metal sheathing have made complaint to the Ways and Means Committee of the House of Representatives that section 10 of the act of June 6th, 1872, is doing them serious injustice, in that it allows sheathing for use upon vessels for foreign trade to be imported duty free, while it makes no provision for drawbacks upon the materials which domestic manufacturers of sheathing are compelled to use. For this reason their trade has already been reduced to the supplying of sheathing for vessels engaged in the coasting trade, but few of which use sheathing at all; and they declare that, unless Congress shall remove the discrimination, they will be compelled to move their machinery and establishments to Nova Scotia, where they can obtain their materials duty free, and also export their sheathing to New York and Boston without payment of duties. To obviate this necessity they offer the following, which they ask shall be substituted for section 10 of the act in question:

"That from and after the passage of this act, all articles of foreign production, excepting plate iron and plate steel, needed for the construction, equipment and repair of American vessels to be employed in foreign trade, between the Atlantic and Pacific ports of the United States, may be used in bond without the payment of duty; or the duty thereon, having been paid, shall be refunded; under such regulations as the Secretary of the Treasury may prescribe.
"Provided, That vessels receiving the benefit of this act shall not be allowed to engage in the coastwise trade of the United States more than — months in any one year, except upon payment to the United States of the duties herein allowed or refunded.
"And provided further, That upon all articles of American manufacture, whether of domestic or foreign material, used for the purpose aforesaid, a rebate shall be paid to the consumer equivalent to the duties upon like manufactured articles when imported, to an amount, in the aggregate, not larger in any one year than the duties which shall have been paid, by the manufacturer thereof, upon raw material of the character of which such articles are chiefly made, and which shall have been actually manufactured by him, under such regulations as the Secretary of the Treasury may prescribe."

There seems to be no good objection to this substitute, since it would take nothing from the treasury that had not been previously paid in as customs dues upon materials which it was the intention of the act to make free. As it is, the act is so ambiguous, and so hedged about with treasury regulations, as to be of but little advantage to shipbuilders, and the proposed modification would have a most beneficial effect upon all who are interested in, or affected by, its provisions.

Our latest mail advices from Great Britain report that the differences between masters and men in South Wales are no nearer an amicable settlement than they were a fortnight ago. Indeed, it would appear that a more intense feeling of hostility is developing, which threatens to end in serious disturbances. Forty or fifty thousand men walking about with their hands in their pockets, and nothing in their pockets but their hands, are a formidable community to deal with, and only a slight provocation is needed to stimulate them to a dangerous activity. As an instance of the mad folly of these men, it is mentioned that they have cut off the fuel supplies of the pumping engines at Cyfarthfa, and have left the mines to be flooded. This is an act that would scarcely be justifiable in war, and when the strike is over the men who have been guilty of this folly will find themselves cut off for months from labor in the flooded pits. In an editorial article on the situation, the London *Times* notes the following startling facts: "In North Staffordshire private residents, with valuable mines at their doors, have to give a month's notice in order to secure coal for house consumption. Large earthenware manufacturers are brought to a standstill, and the North Staffordshire Railway Company are reduced to most difficult straits. In that county this inconvenience is said to be solely produced by the mere fact of the colliers working half-time. But it may serve to illustrate the intimate dependence of our greatest industries upon the iron and coal trades. A strike so extensive as that in South Wales might, if sufficiently prolonged, assume an almost national importance, and the legislature might have to consider how far a passing dispute about wages could be allowed to paralyze the essential conditions of our mercantile energy." But whatever may be the consequences of a long suspension, the Welsh masters are determined to make no concessions, and as the men are equally determined, and very ugly, it would be expecting too much to look for an immediate and amicable settlement of the difficulties.

The Oxidation of Iron.—The interesting article, by Prof. Calvert, on the oxidation of iron, published in our issue of last week, was unfortunately rendered unintelligible at a very important part by an accident to the form in press, by which a part of the type was too much injured to give a legible impression. We therefore give below the portion of the article in which the broken table and unintelligible text occurred:

To ascertain the influence which carbonic acid exerts on the oxidation of iron, I prepared mix-

tures of oxygen and carbonic acid in the following proportions:

25	of oxygen to 75 of carbonic acid.
50	" " " "
75	" " " "
84	" " " "
88	" " " "

Having introduced iron blades and the above gaseous mixtures into bottles, they were inverted over water, so that their necks dipped into this fluid; when half the gaseous mixture had been displaced by aspiration, as in the previous experiments, the following results were obtained, viz.: whilst that portion of the blade standing out of the water in the previous experiments remained for weeks unoxidized, in this series the same section of the blade assumed rapidly a dark color, which became afterward of a dark brown. This change of color was no doubt due, first, to the formation of carbonate of the protoxide of iron, mixed with carbon existing in the iron, and then the excess of oxygen in the mixture converted the carbonate into magnetic or saline oxide of iron, with a little sesquioxide of iron. Whilst these phenomena were proceeding with that portion of the blade exposed to the gaseous atmosphere, the one dipping into the aqueous solution was observed to lose its brilliant and metallic lustre in a few minutes, presenting a black appearance, which became, at the end of three hours, of a dark greenish hue, due to the formation of similar compounds as those above described. In all these experiments the water became not only turbid after a short time, but on the surface of the same floated a considerable amount of magnetic oxide and carbonate of the protoxide of iron, and which varied in quantity according to the relative proportions of oxygen and carbonic acid employed. This series of experiments confirms again the previous ones, that carbonic acid is a most active agent in determining the oxidation of iron.

Scientific and Technical Notes.

M. de Hemptinne, a manufacturing chemist of Molenbeek-Saint-Jean-Bruxelles, has succeeded in establishing,

A PROCESS FOR THE CONCENTRATION OF SULPHURIC ACID WITHOUT THE AID OF PLATINUM, which promises to be of commercial value. The vacuum is made to the degree desired by the condensation of steam injected into a cast iron boiler in communication with the concentrating vessel. The inner sides of this cast iron boiler are covered with wood to prevent the heating of the metal. The concentrating vessel of lead is filled with flints, or with pieces of stones, which are not affected by the acid, and which impart to the vessel the requisite strength to resist the atmospheric pressure. The condensation of the steam in the cast iron boiler is effected by means of a finely divided jet of water. In the lead vessel, which is heated to a suitable temperature, and placed in a partial vacuum, the acid vapors are disengaged, and afterward condensed in refrigerators. When the concentration is completed the acid is drawn off by means of a syphon, and during this operation the furnace is cooled down with a finely divided water jet, in order to prevent the lead vessel being overheated. The hot acid is first cooled in refrigerators, and then is passed into a cistern, where it is obliged to traverse a filter, formed of two walls of lead pierced with holes, the intermediate space being filled with a mixture of powdered stone, glass, and pebbles. These substances retain the sulphate of lead held in suspension by the acid. Or the filtration may be omitted, and the acid left for some days in leaden cisterns, in which it is deposited. Filling the lead vessel for a new operation is effected by atmospheric pressure, when a vacuum has been produced in the vessel. M. de Hemptinne has applied in his apparatus a special system of air valves of his own invention, and which, he says, are perfectly tight. They are formed of two brass discs, very carefully finished, and each pierced with two corresponding holes. The upper disc, which is movable, carries a handle, by moving which the holes in the valve can be closed or opened. According to the calculation of M. Hemptinne, the concentration of one bottle of sulphuric acid, weighing 100 kilogrammes, costs 87 centimes, if effected by the platinum process, and 473 centimes if his vacuum method be adopted.

Prof. C. Stözel, in his recent work on metallurgy, gives the following

HISTORICAL NOTES ON THE CEMENTATION OF STEEL.

The process of cementation, in which a solid body is exposed to the action of pulverized substances at a glowing heat, is a very old metallurgical operation, but nothing definite is known when and where this process was first applied to the production of steel by heating wrought iron in coal powder or carbonaceous materials. It appears, however, that this method was used in France and the Netherlands toward the end of the seventeenth century, and that afterward it was introduced into Sweden and England. In his work: "L'art de convertir le fer forgé en acier," Paris, 1722, Reaumur explains the art of converting iron into steel in detail; in 1772 the Swedish metallurgist, Rinnmann, published a memoir on "the art of ennobling iron," in which he speaks of the furnaces used in Sweden for this purpose. He mentions also that a new furnace of Robsam, invented in 1767, had been introduced, in which wood instead of charcoal was used. In his history of iron (1783) he calls attention to the fact that the cementation of steel in his native country had been brought to such a degree of perfection that very little was to be learned from the foreigners. In England the conversion of steel by means of hard coal furnaces, and with iron imported from Sweden, was carried on principally in the neighborhood of Sheffield; in Germany, it has been in use in Westphalia for about 30 years, and in Austria it was introduced in 1851 in Eibiswald by Tunnor, after the process had been tried and abandoned for forty years.

Exports of Iron and Steel from British Ports—1871 and 1872.

From the Board of Trade Returns.

PRINCIPAL ARTICLES.	Twelve Months ended 31st December.			
	Quantities.		Value.	
	1871.	1872.	1871.	1872.
IRON AND STEEL—Pig Iron—				
To Germany.....	203,284	313,477	561,448	1,510,431
Holland.....	246,092	349,405	790,369	1,804,863
France.....	71,265	90,200	199,571	421,383
United States.....	190,183	193,957	594,086	1,012,441
Other countries.....	346,634	385,687	1,083,934	1,972,848
Total.....	1,057,458	1,332,726	3,229,408	6,721,966
Bar, Angle, Bolt and Rod—				
To Germany.....	15,007	17,783	134,896	194,340
Holland.....	8,376	8,407	80,644	97,946
France.....	766	1,363	7,200	16,375
Italy.....	33,043	19,533	256,823	207,570
Turkey.....	11,176	7,408	86,678	77,169
United States.....	64,301	64,905	534,205	747,701
British North America.....	45,146	46,868	346,280	547,209
British India.....	27,472	16,093	221,856	186,554
Australia.....	12,393	20,865	110,265	209,826
Other countries.....	131,407	110,561	1,142,930	1,291,168
Total.....	349,084	313,876	2,921,777	3,635,558
Railroad of all sorts—				
To Russia.....	78,367	106,305	796,413	1,152,631
Sweden.....	10,918	12,272	91,406	133,134
Germany.....	50,287	50,275	502,681	651,954
Holland.....	14,868	9,026	140,441	125,100
France.....	2,653	2,120	22,218	36,927
Spain and Canaries.....	13,109	11,010	107,573	105,302
Austrian Territories.....	24,360	7,988	187,517	76,722
Egypt.....	16,759	14,472	139,293	152,266
United States.....	512,277	472,760	3,376,857	4,863,677
Spanish West India Islands.....	3,848	2,315	28,646	24,890
Brazil.....	20,519	20,710	151,519	181,087
Peru.....	29,262	34,874	229,132	332,116
Chili.....	11,130	2,845	82,492	34,161
British North America.....	61,961	77,248	544,835	901,631
British India.....	34,523	14,652	254,203	181,201
Australia.....	14,291	25,291	149,678	291,137
Other countries.....	81,675	83,585	699,615	1,000,832
Total.....	981,197	947,518	8,084,619	10,237,768
Wire of Iron and Steel (except Telegraph Wire) galvanized or not.....	26,200	33,605	446,159	674,743
Hoops, Sheets, Boiler and Armor Plates				
To Russia.....	17,334	11,968	189,803	180,013
Germany.....	14,406	15,968	160,460	208,006
Holland.....	8,570	9,813	113,355	138,731
France.....	2,008	3,168	22,251	57,525
Spain and Canaries.....	5,145	6,049	56,857	96,797
United States.....	41,520	31,448	409,686	437,363
British North America.....	16,229	16,027	173,889	249,111
British India.....	15,871	18,308	179,913	276,474
Australia.....	13,928	20,273	254,774	461,152
Other countries.....	65,326	75,401	838,215	1,325,198
Total.....	200,337	208,423	2,309,203	3,430,970
Cast or Wrought, and all other Manufactures (except Ordnance, unenumerated)—				
To Russia.....	14,608	18,779	187,596	265,184
Germany.....	23,051	28,673	274,154	407,986
Holland.....	12,217	13,642	222,801	235,667
France.....	4,359	5,127	103,963	128,012
Spain and Canaries.....	4,188	5,714	72,462	107,047
United States.....	10,671	13,444	180,005	308,004
British North America.....	16,245	21,603	213,321	336,013
British Possessions in South Africa.....	2,480	3,692	45,966	93,020
British India.....	29,499	20,327	403,375	388,758
Australia.....	18,694	23,588	312,246	511,110
Other countries.....	107,416	115,025	1,542,475	1,937,984
Total.....	243,298	269,614	3,588,364	4,778,785
Iron, Old, for re-manufacture.....	139,812	108,181	672,696	661,931
Steel, Unwrought—				
To France.....	1,764	2,935	69,829	111,286
United States.....	21,133	24,051	620,537	779,878
Other countries.....	16,292	18,299	515,062	600,076
Total.....	39,189	45,285	1,198,428	1,491,240
Manufactures of Steel or Steel and Iron combined.....	13,038	11,130	682,855	614,842
Total of Iron and Steel.....	3,169,219	3,388,622	26,124,134	36,060,547
MACHINERY AND MILLWORK—Steam Engines—				
To Russia.....	.....	.....	350,756	302,176
France.....	.....	.....	24,414	21,248
Spain and Canaries.....	.....	.....	39,487	102,459
Egypt.....	.....	.....	348,074	242,122
Brazil.....	.....	.....	51,522	86,409
British India.....	.....	.....	210,251	173,003
Australia.....	.....	.....	64,422	94,258
Other countries.....	.....	.....	978,008	1,581,715
Total.....	.....	.....	2,064,904	2,603,390
Other Descriptions—				
To Russia.....	.....	.....	760,100	815,894
Germany.....	.....	.....	497,592	806,509
Holland.....	.....	.....	264,362	411,734
Belgium.....	.....	.....	159,114	286,827
France.....	.....	.....	314,157	644,395
Spain and Canaries.....	.....	.....	143,611	195,787
Egypt.....	.....	.....	296,976	164,859
British India.....	.....	.....	192,992	261,220
Australia.....	.....	.....	111,818	164,773
Other countries.....	.....	.....	1,161,315	1,843,704
Total.....	.....	.....	3,902,037	5,595,702

Exports of Hardware and Cutlery—1870, 1871 and 1872.

	1870.	1871.	1872.
To Russia.....	£113,917	£166,461	£154,818
Germany.....	293,418	336,395	348,853
Holland.....	122,430	107,339	121,773
France.....	86,985	122,041	175,816
Spain and Canaries.....	74,590	92,637	102,406
United States.....	682,325	741,312	951,887
Spanish West India Islands.....	99,338	131,879	150,445
Brazil.....	234,442	228,960	273,903
Argentine Confederation.....	161,073	108,028	201,169
British North America.....	227,335	285,490	395,848
British India.....	230,204	210,554	261,040
Australia.....	338,792	323,447	472,159
Other countries.....	1,147,536	1,191,842	1,578,647
Total.....	£3,812,385	£4,006,385	£5,081,764

Total Exports of Iron of all Descriptions, Iron Wire and Steel during the Ten Years, 1863—1872.

	1863.	1864.	1865.	1866.	1867.
Tons.....	1,702,573	1,558,930	1,687,171	1,762,485	1,968,025
".....	1,868.	1,869.	1,870.	1,871.	1,872.
".....	2,041,892	2,675,331	2,825,575	3,171,581	3,388,622
Comparative Exports from United Kingdom to United States during Eleven Months Ending					
30th Nov. 1872.	30th Nov. 1871.	30th Nov. 1870.	30th Nov. 1869.	30th Nov. 1868.	30th Nov. 1867.
Pig Iron.....Tons	185,486	179,160	103,675	126,757	83,101
Bar, Bolt and Rod.....	62,357	58,445	43,822	51,635	38,739
Railway, of all kinds.....	441,074	473,687	371,188	277,765	248,246
Tin Plates.....Cwt.	1,649,714	1,614,792	1,430,586	1,406,952	1,164,468
30th Nov. 1867.	30th Nov. 1866.	30th Nov. 1865.	30th Nov. 1864.	30th Nov. 1863.	30th Nov. 1862.
Pig Iron.....Tons	114,271	82,679	62,826	42,865	42,865
Bar, Bolt and Rod.....	41,224	61,056	21,085	72,401	51,970
Railway, of all kinds.....	157,335	96,814	51,196	105,090	60,710
Tin Plates.....Cwt.	1,008,238	1,025,077	758,264	508,499	652,060

Special Notices.

To Malleable Iron Manufacturers.

CAUTION—YOU ARE HEREBY WARNED against making Coke Screening Shovels, either in whole or in part, of Malleable Iron, for any other parties than myself, as it is an infringement of Butler's Patent of June 4th, 1872.

O. R. BUTLER, Patentee,
96 Maiden Lane, New York.

American Pig Iron Manufacturers' Association.

OFFICE, NO. 341 WALNUT STREET,
Philadelphia.

In accordance with the provisions of the Constitution, a stated meeting of the members of this association will be held at the

ST. NICHOLAS HOTEL, N. Y.,

At 11 o'clock, a. m., of

WEDNESDAY, FEBRUARY 19, 1873.

Manufacturers of Pig Iron are invited to attend. All members of the association will please be present in person, or be represented by proxy, as business of importance to the trade will be brought before the meeting.

By order of the Executive Committee,
THOMAS DUNLAP, Secretary.

Hardware Salesman Wanted.

A LARGE MANUFACTURING AND JOBBING Hardware House, in New York, wants to engage four well posted, first-class Hardware Salesmen, to travel and sell goods in the four following sections of the country, viz.: Wisconsin and Minnesota, Southern and Western Indiana and Southern Illinois, Missouri and Western Iowa, Canada and the Provinces. Persons without experience or trade in either of the above four parts need not apply; as parties who are engaged will risk their time and traveling expenses. Address, with reference, I. G., Box 2127, N. Y. P. O.

HORSE SHOE IRON

Of superior quality,

MANUFACTURED BY

NEW HAVEN Rolling Mill Co.

H. T. HAZELL, AUCTIONEER.

By R. T. Hazell & Co.,

Store No. 118 Chambers Street.

OUR REGULAR SALES OF HARDWARE, CUTLERY, FANCY GOODS, &c., will be held on TUESDAYS and FRIDAYS throughout the season. CASH ADVANCES made on CONSIGNMENTS without additional charge.

Proposals For Iron.

OFFICE OF THE N. J. & C. R. R. CO.,
Natchez, Miss., Jan. 15, 1873. 1
Proposals will be received by the undersigned until the FIFTEENTH DAY OF FEBRUARY NEXT, for 300 tons of 35 pound iron rails, of the fish-bar pattern, to be paid for in U. S. currency. Also for 300 tons or more of 35 pound iron rails, of the fish-bar pattern, to be paid for in Adams County Bonds, (first and second coupon off.) (The said bonds bear an interest of 7 per cent. per annum, payable annually, the principal being payable in 15 years from date; the bonds are dated July 1st, 1871, and principal and interest payable at the Bank of America, N. Y.) Or proposals will be received for 400 tons of said iron, one-half to be paid in U. S. currency, and the balance in said Adams County Bonds. The proposals to state what time the said iron will be delivered, and the price of same, f. o. b. vessel to New Orleans; or, if the iron is already in New Orleans, the price of the same there. Proposals will also be received for fish-plates, bolts and spikes sufficient to lay the iron bid for. The bid to state the size of the bolts and plates (the spikes to be 3/4 x 3/4 inches) and the quantities of each and price. Bids for any other quantities than above named will be entertained. The undersigned reserving the right to reject any or all bids.
W. T. MARTIN, President N. J. & C. R. R.

For Sale, &c.

TO NAIL, IRON & PAPER MANUFACTURERS. The very valuable Water Power, Mill Works, Rolling Mills, Machinery, Buildings and Workmen's Houses, on the Agawam River, at East Wareham, Mass., belonging to the estate of S. T. Tidale, deceased, will be sold by auction, together or separately, at 1 p. m., on the 3rd of February. Water-wheels aggregate over 300 horse power; water never failing, and clear as crystal. Apply to K. CORNWALLIS, attorney for the estate, No. 43 Wall St., N. Y., or to SAMUEL HATCH & CO., Auctioneers, Boston.

For Sale

By the undersigned. Sealed bids, accompanied with a good bond as security for the fulfillment of the bid in case the same should be accepted, will be received until March 1st, 1873, for the following described property:

The works of the Greenwood Scythe Co., situated at New Hartford, Conn., on the New Haven and Northampton and Conn. Western R. R., the latter within 100 feet of the works, and it is expected will soon have connection with the Poughkeepsie and Eastern at Millerton, so that coal can be transported at a very low price. The buildings consist of a Hammer Shop, 90x28 feet, and has three complete sets of Hammers; a Grinding House, 130x24 feet, with ten run of stones, with new spindles and all the tools for handling, etc., etc.; and a polishing and paint room of sufficient size to handle twelve thousand dozen in ten working months. The Buildings were erected in 1869, and are in good order. There is a 40 inch Lefel Wheel, under 22 feet head, with good gearing, shafting and pulleys, with large and small driving belts, in readiness to start at once; also an office and warehouse, 90x28 feet, three stories high, in good order, and three Dwelling Houses and a Barn. The water power is excellent, never failing, being on the Farmington River, and below the well known Otis and West Hill Reservoirs, the latter being under the exclusive control of the company. The Brands, Stamps, Good Will, Labors, etc., etc., of the company, such as has been in use by them since commencing business, are also included in the sale. The terms are one-third cash on delivery of deed, and the remainder in equal payments at the expiration of 30 and 60 days from the date of the deed, secured by mortgage of the property. For further information apply to

WM. S. SHAPMOUR, { Committee.
S. K. PRIEST.
New Hartford, Conn.

Trade Report.

Office of THE IRON AGE,
WEDNESDAY EVENING, Feb. 13, 1873.

The operations of the Syndicate have been the principal topic of interest in Wall street during the past week. Members of the Syndicate state that "cash" subscriptions to an amount exceeding the \$100,000,000 of 5-20's called in have been received, beside an amount of subscriptions for exchange of 5-20's for 5 per cent bonds. To this must be added the conversions to be made by the National Banks, which hold \$8,600,000 of 5-20's of 1864 and \$18,250,000 of the issue of 1864—\$26,850,000 in all, of which a large portion are likely to be exchanged for 5s—and \$10,000,000 registered 6s, held at home, which have been called in, and the payment of which will create a demand for an equal amount of 5 per cents. We may therefore consider from 125 to 135 millions of the new bonds as virtually taken. But while the negotiation has been a success in one respect, it has not realized expectations in another, as the balance of the \$300,000,000 are still unprovided for. But the Syndicate have until the 1st of December to negotiate the remainder of the issue, and it is believed that, if the proper means are adopted, they can place a second and, if need be, a third instalment in the home and foreign markets, especially in Germany.

The money market has been active during the week, and at times stringent, owing to the demands of the stock speculators. The rates on call have been 7 @ 7, gold, on pledge of government securities, and 7, gold, to 1-16 per day on stocks. Prime mercantile paper has been in but limited request at 8 @ 12 per cent.

The gold market has been strong, with the following as the extreme fluctuations in the premium:

	Highest.	Lowest.
Thursday.....	113 1/2	113 1/4
Friday.....	114	113 3/4
Saturday.....	114 1/2	114
Sunday.....	114 1/2	114 1/4
Tuesday.....	114 1/2	114 1/4
Wednesday.....	114 1/2	114 1/4

The stock market was surprised on Monday by a declaration of a dividend of 1 1/2 per cent. on Erie common and 3 1/2 per cent. on Erie preferred. At a meeting of the Erie Board of Directors, on Thursday, President Watson submitted the following report of the earnings and expenses of the road for the year ending on Dec. 31, 1872, as certified to by the general auditor of the company:

Gross earnings, in round numbers.....	\$18,694,096
Working expenses for same period.....	\$13,629,965
Interest on the funded and floating debt.....	1,814,043
Rental of leased lines, etc.....	1,233,712
Total.....	16,667,711
Net results for the year.....	\$2,026,585
Less dividend on the preferred stock paid to July 1, 1872.....	\$208,792
Leaving a surplus of.....	\$1,727,598

The following resolutions were then passed unanimously:

Resolved, That upon the statement of the earnings and expenses of the Erie Railway, as submitted by the President, a dividend of 3 1/2 per cent. upon the preferred stock of the company be and is hereby declared out of the earnings of the company for the six months ending Dec. 31, 1872.

Resolved, That upon the statement of the earnings and expenses of the Erie Railway, for the twelve months ending Dec. 31, 1872, as submitted by the President, a dividend of 1 1/2 per cent. upon the common stock of the company be and is hereby declared.

Resolved, That the dividends on the preferred and common stock of the Erie Railway, now declared, be payable on March 15, and that the books of transfer be closed on March 1, at 2 p. m., and remain closed until the morning of March 16.

Of the amount set down as working expenses, \$4,000,000 was paid for new work and iron. The securities and property turned over by Jay Gould to the Company, amounting to \$9,000,000, are not included in the figures given above.

Mr. Barlow stated that the proceeds of the property refunded by Jay Gould will be expended in time in improving the condition of the road. The \$10,000,000 authorized by the Board of Directors at its last meeting has already been taken, as announced by cable telegram, although it was only placed on the London market on Monday. The work of laying the third rail will be begun as soon as spring opens.

After Erie, the principal dealings have been in Western Union, Lake Shore, Ohio, Pacific Mail, C. & C. I. C. and Union Pacific.

The bond market has been firm throughout the week, but the London market has lacked strength. The closing quotations of governments are given below.

The bank statement is again unfavorable, the banks now holding \$2,188,150 lawful money above the 25 per cent. reserve, which is \$1,058,975 less than last week. The following is a comparison of the averages of the past two weeks:

	Feb. 1.	Feb. 8.	Difference.
Loans.....	\$26,879,600	\$29,369,000	Inc. \$2,489,400
Specie.....	18,612,300	19,065,000	Inc. 452,700
Circulation.....	27,501,000	27,520,600	Inc. 19,600
Deposits.....	217,108,500	220,229,200	Inc. 3,120,700
Legal Tm.....	55,482,100	45,107,700	Dec. 10,374,400

The following shows the movement in foreign trade for the week:

	1871.	1872.	1873.
Tot. for week.....	\$7,022,738	\$7,560,475	\$5,929,842
Prev. reported.....	\$7,588,906	\$1,981,517	\$30,388,267
Since Jan. 1.....	\$26,211,504	\$29,494,992	\$42,328,109

Included in the imports of general merchandise for the week are:

Anvils.....	150	\$1,845
Brass goods.....	11	919
Bronzes.....	6	649
Chains and anchors.....	182	8,005
Copper.....	53,509	
Cutlery.....	111	43,057
Guns.....	52	9,314
Hardware.....	64	10,251
Iron, pig, tons.....	843	28,619
Iron, sheet, tons.....	59	5,538
R. R. cars.....	3,280	59,194
Iron, tubes.....	875	3,653
Iron, other, tons.....	848	30,961
Lead, pigs.....	1,368	11,435
Lead, tons.....	5	3,778
Metal goods.....	129	10,811
Nails.....	2	291
Needles.....	9	4,115
Old metal.....	18	7,778
For caps.....	18	1,915
Saddlery.....	7	10,992
Steel.....	2,376	26,323
Spelter.....	17,652	3,650

Tin, boxes.....	21,896	201,826
Tin, bbls.....	35	1,735
Tin, 2028 slabs.....	331,377	71,301
Wire.....	1,392	9,225

EXPORTS, EXCLUSIVE OF SPECIE.

For the week.....	\$4,727,884	\$5,308,173	\$5,357,750
Prev. reported.....	21,340,763	19,065,417	23,023,181
Since Jan. 1.....	\$26,068,147	\$34,373,590	\$28,380,931

Included in the exports of domestic products are the following:

Agricultural Implements, pkgs.....	813	\$19,506
Arms, cases.....	4	1,342
Brass goods, cases.....	1	125
Car wheels.....	30	350
" " cases.....	4	344
Cartridges.....	65	1,249
Copper, sheets.....	8	1,756
Hardware, cases.....	300	9,856
Iron.....	29	290
Iron, Manufactures of, pkgs.....	29	1,164
Machinery, pkgs.....	543	115,406
Nails, kegs.....	113	115
Tr. bags.....	1,003	2,500
Pistols, cases.....	2	956
Pumps.....	8	247
Railroad Materials, pkgs.....	18	4,779
Sewing Machines, cases.....	109	9,294
Silverware, pkgs.....	1	251
Tacks, boxes.....	103	1,301
Tinware, cases.....	4	200
Wire, bbls.....	2	191

EXPORTS OF SPECIE.

Total for the week.....	\$1,642,370
Previously reported.....	6,550,812
Total since January 1, 1873.....	\$8,213,182

Government bonds close steady as follows:

	Bid.	Asked.
U. S. Currency 6s.....	113 1/4	113 1/2
U. S. 6s, 1881, reg.....	113 1/4	113 1/2
U. S. 6s, 1881, c.....	113 1/4	113 1/2
U. S. 6s, 5-20 reg. May and Nov.....	113 1/4	113 1/2
U. S. 6s, 1862, c.....	113 1/4	113 1/2
U. S. 5-20 1864, c.....	113 1/4	113 1/2
U. S. 5-20 1865, c.....	113 1/4	113 1/2
U. S. 5-20 1867, r. Jan. and July.....	113 1/4	113 1/2
U. S. 5-20 1865, c. Jan. and July.....	113 1/4	113 1/2
U. S. 5-20 c. 1867.....	113 1/4	113 1/2
U. S. 5-20 c. 1868.....	113 1/4	113 1/2
U. S. 10-40 reg.....	113 1/4	113 1/2
U. S. 10-40.....	113 1/4	113 1/2
U. S. 5s of 1881, reg.....	113 1/4	113 1/2
U. S. c.....	113 1/4	113 1/2

The following were the highest and lowest prices of stocks to-day:

	Highest.	Lowest.
N. Y. Cen. & Hudson Consolidated.....	102 1/4	102 1/4
Lake Shore.....	113 1/4	113 1/4
Rock Island.....	111 1/4	111 1/4
Wabash.....	72 1/4	72 1/4
Harlem.....	121 1/4	120 3/4
Western Union Telegraph.....	87 1/4	86 3/4
Milwaukee & St. Paul.....	52 1/4	52 1/4
Pacific Mail.....	74 1/4	73
Erie.....	65 1/4	65 1/4
Ohio & Mississippi.....	47 1/4	46 3/4
Boston, Hartford & Erie.....	39 1/4	39 1/4
Union Pacific.....	32 1/4	32 1/4
C. C. & I. C.....	42 1/4	41 3/4
Atlantic and Pacific preferred.....	32 1/4	32 1/4
Hannibal & St. Joseph.....	49 1/4	47 3/4
Consolidated Coal.....	51 1/4	50 3/4
New Central Coal.....	45 1/4	42 3/4
American Coal.....	63 1/4	62 3/4

GENERAL HARDWARE.

There is a very fair business doing to-day, and many Hardware houses are decidedly busy. A great deal of firmness prevails, and prices are very well sustained. The changes in price have not been many.

We make our quotation of Seymour's Shears, this week, discount 55 per cent. T. Rowland & Sons, Philadelphia, give notice by circular, dated the 8th instant, that they advance list prices as follows: On all Plain Black Goods, \$2 per dozen, and \$1 per dozen on Back Strap goods. Discount 20 per cent., and 3 per cent. for cash within 30 days. All accounts not settled within 90 days will be drawn for at sight, with exchange. No freight allowed, and all orders received subject to change in price.

Louderback, Gilbert & Co. have removed to 53 Chambers street, where they have increased facilities for filling orders. They are agents for the Connecticut Cutlery Co. and have on hand a full line of their goods. Their new price list will be issued in a few days.

Sidney Shepard & Co., Buffalo, N. Y., have issued, under date of January 1st, 1873, an illustrated catalogue of the goods of their own manufacture, comprising a large assortment of Stamped Tin Ware, Retinned Goods, Ladies' and Timmers' Trimmings, Japanned Tin Ware, a great variety of Toilet Ware, Tin Toys, Candlesticks, Sheet Iron goods, Coal Vases, Coal Hods, Stove Boards, Cream Freezers, Grocers' Cannisters, and kindred articles. A revised price list to accompany the catalogue is sent on application.

There is an improved demand for English goods noticeable this week, and while prices are remarkably firm, no advances have yet taken place. 1/2 Coil Chain is quoted at 8 1/2 @ 9 cents, gold; but strong holders have declined selling at the former price, and the latter figure represents more nearly the selling rate. Peter Wright's Anvils are firm at our quotations, with a good demand. The disturbed condition of the labor market at present is not confined to the British Isles. It is felt on the Continent of Europe, and its demoralizing influence is especially noticeable among the manufacturing establishments of Solingen, Germany. The manufacturers of Scissors and other Cutlery, at Solingen, have concluded to close their works for four months, commencing on March 1st—not for any lack of orders at fair prices, but the constant troubles with the workmen have rendered it impossible to establish any scale of prices to sell by, and manufacturers prefer to totally suspend operations until something definite with regard to price is arrived at. Under such circumstances, quotations for German Cutlery are only nominal.

The state of the Nail market is much improved since last writing. The demand continues good, and we have heard of orders for 3000 keg lots being declined at \$4 75, net. Within a day or so Nails have advanced 50 cents in Boston, and are now held there at \$5-50 rates. In Western New York manufacturers of Nails have advanced their rates 25 cents, and are now holding 1000 keg lots at \$5, net. With Nails bringing higher prices both east and west of this market, it is very firm to be wondered at that holders are very firm in their views, and there is no disposition whatever to press sales. We quote Nails firm at \$5 rates. Lots of 100 kegs can be had at \$4 85, net, and for 1000 kegs, \$4 80 is a fair quotation. The following are the prices for Gooch's I-X L Ice Cream Freezers, for 1873:

For the week.....	\$4,727,884	\$5,308,173	\$5,357,750
Prev. reported.....	21,340,763	19,065,417	23,023,181
Since Jan. 1.....	\$26,068,147	\$34,373,590	\$28,380,931

SIZES FOR FAMILY USE.					
2	3	4	6	8	10 Quarts.
\$4	\$5	\$6	\$7	\$8	\$9 Each.

Less discount 33 1/3 per cent.

Less discount 33 1/3 per cent.

3	4	5	6	8	10 Gallons.
\$15	\$17	\$20	\$23	\$26	\$30 Each.

Less discount 25 per cent.

The dashers for these Freezers are so con-

Less discount 25 per cent.

The dashers for these Freezers are so constructed as to take the cream clean from the can at every revolution of the crank. The bottoms of the cans are of Cast Iron, galvanized, and are made concave, so that the cans will stand steady on the floor when out of the tub. The small sizes, designated by quarts, are warranted to hold the full amount claimed, while those for confectioners and hotel use will hold from one to three quarts over the amount called for. James E. Halsey, 76 Reade street, is agent for these goods.

IRON.

American Pig.—The market for American Iron continues quiet and without new feature of importance. In our remarks last week, we intended to say that the season's demand for Iron for immediate delivery had not fairly commenced, instead of "the season's demand for contracts," as it appeared. There has been rather more doing the past week for consumption, and we hear of the sale of 2000 tons Foundry Iron, the terms of which, however, did not transpire. Lehigh brands of Forge Iron are offering very sparingly, while some of the larger companies are refusing to name prices at the moment. We quote nominally at \$42, but it is doubtful if much could be obtained at that figure. No. 1 Lehigh is held firm at \$50, and No. 2 extra, at \$48.

Scotch Pig.—The business in Scotch Iron is still limited to small parcels, the extreme views of holders checking transactions. The continued troubles abroad among the colliers and miners, increasing the cost of production, tends to strengthen holders here, and nothing is offered except at full prices, and bids a trifle under are not considered a moment. Indeed in the sales since our last have been 100 tons Gartsherrie at \$59, and 100 tons Coltness at \$62-50. We quote: Coltness, \$60 @ \$62-50; Gartsherrie, \$59 @ \$60; Glengarnock, \$57 @ \$58; and Eglinton, \$56; the stock of the latter being especially light.

Following are the prices of Scotch Pig Iron in Glasgow, as reported by Messrs. J. E. SWAN & BRO., under date of January 17, 1873:

GLASGOW BRANDS.		
No. 1	No. 3	No. 4
Gartsherrie.....	147 1/2	130 1/2
Coltness.....	150 1/2	130 1/2
Summerlee.....	142 1/2	130 1/2
Langloan.....	150 1/2	130 1/2
Govan.....	130 1/2	130 1/2
Calder.....	130 1/2	130 1/2
Shotts, Bessmer.....	170 1/2	165 1/2
do Ordinary.....	140 1/2	130 1/2
Cambroo.....	140 1/2	130 1/2
Wishaw.....	130 1/2	125 1/2
Monkland.....	130 1/2	128 1/2
Chapelhall.....	132 1/2	130 1/2
Clyde.....	130 1/2	128 1/2
Quarter-Clyde.....	130 1/2	128 1/2
Glasgow Warrants 3-5, No. 1; 2-5, No. 3, e. m. b.	128 1/2	128 1/2

At o. b. Glasgow, 1/2 per ton, extra.

WEST COAST BRANDS—f. o. b. Ardrossan.

CURRENT RATES OF FREIGHT ON PIG IRON.		
To	From Glasgow.	From Ardrossan.
New York.....	15 1/2	15 1/2
Boston.....	12 1/2	12 1/2
New Orleans.....	20 1/2	20 1/2
Baltimore.....	20 1/2	20 1/2
Philadelphia.....	20 1/2	20 1/2
Providence.....	20 1/2	20 1/2

Bar.—The market for Refined from store continues quiet, but prices held very firm, with foreign advices all favorable to the selling interest.

Old Rails.—There has been rather more doing in Old Rails the past week, though the trade is by no means brisk. Prices are very firm, and but little, if any, could be obtained at the close below \$60, currency. Sales include 150 tons Double Head at \$57; 300 tons at \$57-30 days; 500 tons here and 500 tons at Philadelphia, both on private terms, and 250 tons old American at \$52, currency.

Rails.—New English continue quiet at \$72 @ \$74, gold. New American are without reported movement, but the prices remain steady at \$80 at the mills in Pennsylvania.

Scrap.—Holders of Scrap Iron are very firm, and generally asking \$60 from yard, though it is thought that some lots might be had for \$57-50. Prices ex ship are too irregular to admit of a correct quotation. Sales include 900 tons, to arrive, at \$58, and 100 tons from yard on private terms.

METALS.

Copper.—The demand for domestic Copper has been good the past week, and as the stock of Lake is only moderate, and not more than enough to supply an average demand until fresh supplies can be obtained, which will probably be fully three months later, prices show a shade stronger tone, and sales have generally been effected at an advance of 1/2 c. @ 1 c. over the figures current at the date of our last issue. The sales foot up fully 1,000,000 lbs. Lake, commencing at \$4c. and selling up to 35c., cash, and 35c. up to 35 1/2 c. March and April delivery, the market closing at the highest figures. The production of Copper in the Upper Peninsula is given at 15,166 tons in 1872, against 16,071 tons in 1871, which is a falling off of 905 tons. English Copper was quite active during the earlier portion of the week, but toward the close the market became more quiet, though holders are firm for spot delivery. For future, however, the offerings are at 1/2 c. @ 1/2 c. per lb. lower. Sales embrace 250 tons Best Selected at 30c. @ 30 1/2 c. spot, and 30c. to arrive; closing at 30 1/2 c. @ 30 1/2 c. spot, and 30c. to arrive. Manufactured Copper and Yellow Metal continue steady at former prices. We quote New Sheathing at 43c., Bolts and Braziers at 45c., Bronze and Yellow Metal Sheathing at 27c., and Yellow Metal Bolts at 32c., net cash.

Tin.—The business in Pig continues limited

to the smallest parcels suitable for pressing wants, and prices are wholly nominal. We only hear of sales of about 50 or 75 slabs Straits, at 31c., gold. We quote: Straits, 30 1/2 c. @ 31c.; English, 31c., and Banca, 30c. @ 30 1/2 c., all gold prices. There has been considerable improvement in the demand for Tin Plates, and as stocks are light and becoming steadily reduced, prices are held very strong at an advance, closing with the tendency still upward. We quote: L. C. Charcoal, \$11-50; L. C. Coke, \$10 @ \$10-25; Coke Terne, \$8-75 @ \$9-25, and Charcoal Terne, \$10-25 @ \$10-50.

Lead.—There is little, if any, change to notice in the general features of the Pig Lead market. Holders are asking 6 1/2 c. @ 6 3/4 c., gold, for ordinary foreign, and we have to notice sales of 150 tons Spanish at the inside figure. Manufactured Lead continues quiet, but prices steady at 9 1/2 c. for Bar, 10 1/2 c. for Sheet and Pipe, and 16 1/2 c. for Tin-Lined Pipe, less the usual discount to the trade.

Spelter and Zinc.—There was a fair inquiry early in the week, and sales effected of 50 tons Silesian at 7 1/2 c. @ 7 3/4 c., gold, but during the latter portion the market has ruled quiet, though the advance is fully sustained. Zinc has met a moderate inquiry at fair prices. Sales include 100 casks Mosselmann at 9 1/2 c., less 4 per cent., gold, and 10 casks from dealers' hands at 9c., net, gold. We quote the market firm at 10c. @ 10 1/2 c.

Antimony.—There is only a light demand for Regulus, and we only hear of 5 casks selling at 14 1/2 c., gold, generally held at 14 1/2 c., gold.

PHILADELPHIA.

Messrs. LLOYD, SUPPLEE & WALTON, under date of Feb. 11th, write as follows: There has been considerable improvement in trade during the last week. Mail orders have been quite frequent, fair orders are being received from traveling salesmen, the number of buyers in the city is daily increasing, and many of the jobbing houses present quite an appearance of activity already. The most important change during the week has been the compromise between the Rowland's, manufacturers of the different makes of Rowland's Shovels. The list upon the Plain Black Shovels has been advanced two dollars (\$2) per dozen, (not one dollar (\$1), as first supposed), and one dollar (\$1) per dozen advance upon the Back Strap Shovels with discount 20 per cent on their entire line of shovels. At this price they demand net cash without any allowance for freight, which was allowable under the old discount, 5 and 5 per cent. The Rowland's refuse to fill any orders which they may have upon their books at better prices than the above. Horse Shoes have opened for 1873 at higher rates than was anticipated by the trade; they are now held at \$6-12 per keg. Nails still remain at \$5 rates, but an advance is anticipated. 3d Fine Nails are still held at \$7-50 per keg. Other goods remain without any changes, and prices appear firm.

PITTSBURGH.

LOUISVILLE.

Mr. Geo. H. HULL, under date of Feb. 10, writes us as follows: Forge Irons have been in good demand throughout the week, at full figures. The stock of Cold Blast is light, and arrivals are principally taken up on old contracts. The usual time, four months, is allowed on quotations below:

HOT BLAST CHARCOAL.	
No. 1 Fdry, from Hanging Rock Ores.	\$5.00 @ 56.00
" " " " " " " "	53.00 @ 54.00
" " " " " " " "	45.00 @ 47.00
" " " " " " " "	54.00 @ 55.00
" " " " " " " "	52.00 @ 53.00
" " " " " " " "	45.00 @ 47.00
" " " " " " " "	56.00 @ 57.00
" " " " " " " "	55.00 @ 56.00

HOT BLAST STONE COAL.	
No. 1 Fdry, from Missouri Ores.	54.00 @ 55.00
" " " " " " " "	52.00 @ 53.00
" " " " " " " "	41.00 @ 45.00

COLD BLAST CHARCOAL.	
Car Wheel from Hanging Rock Ores.	60.00 @ 65.00
" " " " " " " "	60.00 @ 62.00
" " " " " " " "	60.00 @ 62.00
" " " " " " " "	58.00 @ 60.00
" " " " " " " "	58.00 @ 60.00

BALTIMORE.

Messrs. WYETH & BROTHER, Iron and Steel merchants, corner of South Charles and Lora hard streets, report us the following prices, under date of Feb. 11, 1873: Trade fair for the season, the demand is a little more quiet, but quotation figures are firm, as there is little or no margin between the manufacturers' and dealers' rates, and even these are at times undersold to book desirable orders. Supplies are arriving somewhat more freely, and a good spring trade is anticipated.

AMERICAN REFINED BAR IRON.	
1 to 6 wide by 1/2 to 1 thick.	4 1/2 cts. to 4 3/4 cts. per lb.
1 to 4 wide by 1/2 to 1 thick.	4 1/2 cts. to 4 3/4 cts. per lb.
Round and square, ordinary sizes, from 1/2 to 3 inclusive.	4 1/2 cts. to 4 3/4 cts. per lb.
Hoop Iron, 1 1/2 wide and 3/4 thick.	5 1/2 cts. per lb.
Band Iron, from 1 1/2 to 4 wide.	5 to 5 1/2 cts. per lb.
Horse Shoe Iron, 1 1/2 wide by 3/4 thick.	5 to 5 1/2 cts. per lb.
Black Diamond Cast Steel Plates, Squares and Octagons, ordinary sizes.	17c. to 18c. per lb.
Machinery Steel.	12c. to 13c. per lb.
Cast Spring Steel.	11c. to 12c. per lb.
Homogeneous Steel Plates.	13c. to 14c. per lb.
Perkins' Horse Shoes, per keg of 100 lbs.	\$6.12 1/2
Mule Shoes.	7 1/2 cts. per lb.
Common Horse Nails, from 14c. to 18c. per pound.	
Pennam Horse Nails, 23 1/2 to 25 1/2 cts. per lb.	
R. R. Spikes.	5 1/2 by 9-16 at 5 1/2 cts. per lb.

SAN FRANCISCO.

FEB. 8.—Hardware.—Business is fair for the season and prospects never better for the year. Stocks are only moderate yet. Metals.—Our market fails to respond to the late rise as telegraphed from England. It of course has some influence in turning the attention of operators and the trade to the probable future of the market, as influenced by this movement. It has long been an established fact, known to the trade on this coast, that Tin Plate could be imported and sold by certain New York houses at 20 per box cheaper than others, and it is believed that a check has now been sent to this fraud. We here note a sale of 100 boxes Terne Charcoal Plate, 14x20, at \$13. The price of Pig Iron is entirely nominal, say \$50 to \$55. There were, however, sales early in the month of 500 tons Scotch at \$45 to \$48, but not made public. Nails.—The stock is large and the price of invoice lots entirely nominal. Trade prices remain as heretofore: \$6 for 10d.; \$6.50 for 8d. and 9d., 25c. per keg above 10d.; 6d. and 7d., 50c. do. do. 10d.; 4d. and 5d., 75c. do. do. 10d.; 3d., \$1.50 do. do. 10d.; 2d. and 3d. fine, \$2.25 do. do. 10d.; Cut Spikes, all sizes, 25c. above 10d. Thus the jobbers' range is \$6 to \$9.—*Com. Herald.*

CINCINNATI.

Messrs. ADDY, HULL & Co., under date of Feb. 10, writes us as follows: The improved tone noted in our last has continued throughout the week, with an active inquiry. Sales of some round lots at private terms have been recorded. Buyers, however, as a rule, are disposed to wait for further developments, while the feeling on the part of holders is to advance prices. Best grades of Foundry Irons are in special request. The stock, however, is still limited, and considerable difficulty is experienced in meeting the current demand. Car Wheel Irons are quiet, though firm. Quotations are as yet unchanged, though likely to advance at any time.

HOT BLAST CHARCOAL.	
Hanging Rock No. 1.	\$5.00 @ 56.00—4 mos.
" " " " " " " "	53.00 @ 54.00—4 mos.
" " " " " " " "	45.00 @ 47.00—4 mos.
Tennessee No. 1.	54.00 @ 55.00—4 mos.
" " " " " " " "	44.00 @ 45.00—4 mos.
Alabama No. 1.	55.00 @ 56.00—4 mos.
Missouri No. 1.	56.00 @ 57.00—4 mos.
" " " " " " " "	54.00 @ 55.00—4 mos.

HOT BLAST STONE COAL.	
Missouri No. 1.	\$5.00 @ 56.00—4 mos.
" " " " " " " "	44.00 @ 45.00—4 mos.
Ohio No. 1.	54.00 @ 55.00—4 mos.
" " " " " " " "	41.00 @ 42.00—4 mos.
Scotch Pig, No. 1.	54.00 @ 55.00—4 mos.

COLD BLAST CHARCOAL.	
Hanging Rock Car Wheel	\$60.00 @ 65.00—4 mos.
" " " " " " " "	60.00 @ 62.00—4 mos.
Kentucky " " " "	60.00 @ 62.00—4 mos.
Tennessee " " " "	60.00 @ 62.00—4 mos.
Georgia " " " "	60.00 @ 62.00—4 mos.
Alabama " " " "	60.00 @ 62.00—4 mos.
Machinery and Forge.	80.00 @ 85.00—4 mos.
Blooms.	112.00 @ 116.00—4 mos.

FOREIGN.

GREAT BRITAIN.

Messrs. J. Berger Spence & Co., London, Glasgow and Manchester, under date of Jan. 20th, 1873, report:

Metals.—The experience of the past week has fully confirmed previous anticipations of an active metal market. Prices have been fully maintained, and in some cases improved upon, while even at the most extreme figures it is difficult to place any large orders, quotations for Manufactured Iron being made as only for the time being, and for limited quantities. The Glasgow market has steadily improved, and the shipments again show a considerable increase. Business in Warrants was active early in the week, at from 123 1/2 to 126; subsequently advancing, and closing at 128 to 129. Middleborough makers are all well booked and pressed for delivery to the full extent of their productive capacity, some firms positively declining to make quotations in expectation of yet higher prices being established. Copper has fluctuated during the week, and, although the tendency has been downward, no quotable decline has taken place in Tough Ingots, which is still firm, while Chili bars have depreciated about 20 per ton. The demand for Tin continues good, and smelters are obtaining advanced rates. Lead is still scarce, English soft Pig being held for a further rise of 10 per ton; and even at the advanced quotation of \$22.10, smelters are not anxious sellers. Spelter firm, at an advance, \$24 and \$25 being now the prices asked for Silesian and English respectively.

IRON.—"Ayresome" Yorkshire Pig Iron,

nominal, No. 1, 112 1/2; No. 2, 107 1/2; No. 3, 105 1/2; No. 4 (Foundry), 104; No. 4 (Forge), 104; net cash, or 2 extra 4 months' bills. Scotch Pig, Warrants, 128 to 129. Staffordshire Bars, \$12.10 to \$13.10. Hoop Iron, \$13.10 to \$14. Gas Tubes, 30 per cent. off new list. Boiler Tubes, 5 per cent. premium.

COPPER.—Nominal. English Tough, Ingots, \$28 to \$29. Chili Bars, \$29 to \$30. Tin.—English Ingots, \$145 to \$146. Straits, \$143 to \$144.

TIN PLATES.—Best Coke, I. C. 34 to 38; Charcoal, I. C. 40 to 45 per box.

LEAD.—Best English Soft Pig, \$22 to \$23.10; Refined Red Lead, \$24 to \$25.

ANTIMONY.—French Star, \$68 to \$70. SPELTER.—Silesian, special brands, \$23. English, best brands, \$25.

IMPORTATIONS.

Of Hardware, Iron, Steel and Metals into the Port of New York, for the week ending February 11, 1873:

Hardware.

Abbott & Howard, Files, cks. 1

Blumenthal J. & A. Cases, 19

Bokor Hermann & Co. Mds. pkgs., 3

Chains, cks., 164

Screws, cks., 45

Cases, 6

Beam & Murray, Casks, 9

Mds. pkgs., 34

Bodenheim, Meyer & Co. Bundles, 520

Busch R. T. & Co. Fish plates, bds., 681

Phelps, Dodge & Co. Bundles, 600

Poor H. J. & H. W. Bars, 18

Page & Co. Bars, 3245

Salomon A. H. & Co. Scrap, tons, 19; cwt., 3

Smith G. G. & Co. Sheets, 125; bds., 321

Tung & Co. Bars, 8716

Woods, Fraser & Co. Scrap, tons, 21

Whitney A. R. Bars, 122

Whitney C. W. Bundles, 108

Woodhouse & Rudd, Rails, 486

Order.

Bar, bds., 400

Pig, tons, 1286 1/2

Bundles, 511

Sheets, 187; cases, 38

R. R. bars, 4337

Scrap, tons, 496 1/2

Old rails, 616

Rails, 365

Without bills of lading.

Pig, tons, 285

Sheets, 294

Rails, 1031

Steel.

Abbott & Howard, Plates, 107; cases, 4

Cockayne J. W. Bundles, 329

Cases, 28

Drexel, Morgan & Co. Rails, 755

Gill John, Cases, 1

Hogan John, Mds. pkgs., 38

Mds. pkgs., 43

Cases, 41

Casks, 3

Hugill Chas. Cases, 7

Bundles, 289

Justice P. S. Bundles, 2

Blooms, 2

Jarvis G. E. Rails, 1102

Kurtz Gust. Pkcs., 121

Lloyd & Haigh, Bundles, 294

Moss F. W. Cases, 18

Bundles, 621

Bars, 16

Naylor & Co. Axes, 274

Tires, 32

Bar, cases, 12

Piersons & Co. Bundles, 571

Sanderson G. & Co. Bundles, 28

Cases, 11

Slag Joseph, Cases, 17

Mds. pkgs., 57

Van Wart & McCoy, Bundles, 1215

Vose, Dinmore & Co. Bundles, 188

Wardlaw W. C. Bundles, 1

Mds. pkgs., 26

Order.

Bundles, 591

Rails, 561

Metals.

Bruce & Cook, Tin plates, bxs., 500

Cox H. J. Bars, cks., 1

Dickerson J. S. & Co. Tin, bxs., 512

Jex Wm. Scrap, bxs., 1

Middleton & Co. Scrap copper, tons, 1

Scrap lead, tons, 1

Nelson Wm. J. Scrap, pkgs., 3

Naylor & Co. Tin plates, bxs., 1960

Phelps, Dodge & Co. Tin plates, bxs., 25

Salomon A. H. & Co. Copper, cks., 3

Brass, cks., 1

Order.

Scrap, copper, cks., 116

Tin and terne plates, bxs., 16,049

Tea lead, cks., 23

Lead, pigs, 757

Spelter, plates, 4969

Copper, ingots, 1599

Cks., 55

Lead, bars, 3374

Scrap lead, cks., 30

Without bills of lading.

Tin plates, bxs., 1745

Dutch Tin Reports.

(Translated for The Iron Age from the "Revue Hebdomadaire.")

AMSTERDAM, Jan. 14, 1873.—In "spot" Billiton Tin some business has been done this week at 83 guilders. Nothing doing in Banca, nominally quoted 85 1/2 to 86.

(Private Letter.)

AMSTERDAM, Jan. 21, 1873.—The next Tin sale has been fixed at Batavia, to take place on the 3d of February, and I think it will go higher than the last one, say 86 guilders the picul. It is impossible to have an opinion about this gambling article.

ROTTERDAM, Jan. 14, 1873.—A firm tone has continued to prevail for Tin, of which sales have been making as follows: Banca, usual prompt, 86 1/2 to 87 1/2; April—May, 84 to 85; Billiton, spot, 83 to 85 1/2; afloat, 82 1/2 to 83. The asking price, spot, for Banca, is now 87 and for Billiton 84 guilders.

ROTTERDAM, Jan. 21, 1873.—The Tin market is remarkably firm, and Banca, "spot," has

been done at 87 to 87 1/2; spring auction at 85; Billiton, "spot," 83 1/2 to 84; afloat, 83 to 84; Banca, "spot," is now held at 88 and at 86 for spring auction, and Billiton, afloat, per steam, at 85.

Siemssen & Co.'s Chinese Metal and Coal Report.

(Translated for The Iron Age.)

SHANGHAI, Dec. 5, 1872.—Metals unaltered and dealings limited. Best bands of Nail Iron 3 1/2 to 3 3/4 taels, common brands 3 1/2 to 3 3/4; Rod Iron, Dawes, 3 to 3 1/2 taels; Steel can be got rid of at low rates only. For plates no more than 8 1/2 taels can be obtained, the arrivals having been unusually heavy. Iron Quicklime 70 1/2 California, 80 taels. In Coals but a restricted business has been transacted, prices being in favor of purchasers. Sales of Cardiff coal have been made at 9 1/2 taels, American is nominally 9 1/2, Sydney 9 1/2 to 9 1/2, Newcastle, New South Wales, 9 1/2, Japan, 5 1/2 to 5 1/2, Formosa, 5 1/2 per ton. P. S.—Lead.—The higher European telegraphic accounts have favorably influenced the position of the metal in the Chinese ports, and nothing can now be procured below 4 1/2 taels.

B. Amsberg & Co.'s Australian Copper Report.

PORT ADELAIDE, Dec. 6, 1872.—Copper.—The English mail arrived on the 19th of Nov. with letters up to the 4th of Oct. and telegrams up to the 30th of Oct., since when the Port Adelaide line has kept us supplied with late cable telegrams reporting copper at London \$200. Business has been quiet here, and we quote Burra-Burra copper, as well as Wallaroo, \$289 per ton. Spelter in plates, \$23 per ton. Exchange.—Banks sell at half per cent. premium, and buy at three-quarter per cent. discount.

Dummler & Co.'s Batavia Metal Report.

(Condensed for The Iron Age.)

BATAVIA, Java, Dec. 11, 1872.—Metals remain very quiet and no change in the value of Iron is to be reported; the demand is very limited. Holders of Iron Nails are firm; dealers have still supplies on hand, and are unwilling to pay the higher rates asked. Copper is rather weak, and in slight demand. The stock of Dutch is slight. Tin.—On the 9th instant 8036 piculs Billiton were sold at an average of 82 1/2 guilders per picul.

Dummler & Co.'s Special Tin Auction Telegram.

(Transmitted to The Iron Age.)

BATAVIA, Feb. 3, 1873.—Billiton Tin sale, average 87 1/2 guilders.

Rautenberg, Schmidt & Co.'s Singapore Metal and Coal Report.

(Translated for The Iron Age.)

SINGAPORE, Dec. 19, 1872.—Iron quiet and without anything doing. Tin was quiet after the last mail at \$32 1/2 to \$32 3/4 per picul, equal to \$131 1/4 to \$132 1/4 per ton, cost and freight, but later on a lively demand arose, and the market was swept at \$33 1/2 to \$34 1/2 (equal to \$138 1/2 to \$139 1/2). The market closes firm at \$34 1/2. Coal—Cardiff is in good demand; two cargoes afloat, of 600 and 900 tons respectively, were sold at \$11 to \$10 1/2, three months. West Hartlepool neglected as heretofore.

The Metal Trade of Hamburg in 1872.

(Translated for The Iron Age from the Borsen-halle.)

HAMBURG, Jan. 16, 1873.—Metals.—The opinion expressed at the close of 1871, that an animated business was drawing near, has been confirmed. The extraordinary movement in Central Europe in all branches of industry was eminently calculated to stimulate the consumption of metals of every kind, while, on the other hand, production was crippled by the agitation of the labor question. Copper.—The last months of 1871 had been unusually brisk, and 1872 opened with a slight reaction from such activity—of short duration, however—followed, as it soon was, by a lively speculation. Up to June prices uninterruptedly rose, then suddenly weakened and returned to the starting point of the year. Toward the end of the year an easier money market once more came to the assistance of the staple. Tin.—This metal has been pursuing a vacillating course, and, on the whole, has neither resulted in a great decline nor in a great improvement. Lead.—Lead has risen something like two marks during the course of the year. At Hamburg dealings in it might have been more extensive. Spelter.—There has been a constantly diminishing supply at this leading Spelter market while the year lasted, the receipts being 100,000 cwt., against 169,000 in 1871. Yet there was an absence of inclination on the part of speculators to meddle with this metal, and hence transactions were of a limited nature, being confined to covering the current requirements of consumption. At the commencement of the year prices had taken their lowest level at 14 marks 10 shillings, to gradually reach 15 marks 2 shillings, and toward fall, with an increasing demand, the diminishing supply, were carried to 15 marks 8 shillings on the spot, at which figure some business was transacted in December. The asking price at the close of the year was 15 marks 10 shillings on the spot, and 15 marks 8 shillings afloat. The stock does not exceed 10,000 cwt.

IMPORTS AND STOCK OF SPELTER AT HAMBURG, AND RANGE OF VALUE.

	Import.	Dec. 31.	Dec. 31.
	cwts.	cwts.	Mks.
1843.	180,000	45,000	14 1/2
1844.	214,000	70,000	14 ..
1845.	155,000	70,000	13 ..
1846.	152,000	85,000	12 1/2
1847.	250,000	115,000	12 1/2
1848.	170,000	110,000	10 1/2
1849.	270,000	170,000	10 1/2
1850.	320,000	110,000	9 1/2
1851.	319,000	105,000	9 1/4
1852.	342,000	112,000	12 ..
1853.	299,000	137,000	15 ..
1854.	313,000	94,000	12 1/2
1855.	275,000	70,000	14 1/2
1856.	360,700	40,000	17 1/4
1857.	378,000	35,000	14 ..
1858.	365,000	50,000	14 1/2
1859.	370,000	65,000	14 ..
1860.	245,000	80,000	12 1/2
1861.	278,000	54,000	11 ..
1862.	225,000	100,000	14 1/2
1863.	292,000	25,000	12 ..
1864.	530,000	28,000	12 1/2
1865.	315,000	30,000	12 1/2
1866.	345,000	30,000	14 1/2
1867.	399,000	50,000	13 ..
1868.	265,000	40,000	13 ..
1869.	236,000	30,000	12 1/2
1870.	245,000	30,000	12 1/2
1871.	169,000	45,000	14 1/4
1872.	100,000	10,000	15 1/2

largest total ever known in any one year. Of this amount steel is down for £554,690; Bessemer steel rails, £375,838; do. fish plates, £2572; do. axles, £2599; steel tires, £33,000; cast steel tire blooms, £25,280; cast steel axles, £11,205; do. springs, £5580; iron wire, wire rods, &c., £14,834; anvils, £1890; cutlery, £356,231; files, £115,899; saws, £4830; tools, £22,828, and so on down to £40 worth of Jew's harps. The Board of Trade accounts show the following exports of iron and steel, in various stages of manufacture, the produce of the United Kingdom: In 1870, 2,825,575 tons, value of £24,038,090; in 1871, 3,169,219 tons, value of £26,124,134; in 1872, 3,388,622 tons, value of £26,060,547. The export of 1872 was constituted as follows: 1,332,736 tons of pig iron, of the value of £6,721,066; 313,876 tons of bar, angle, bolt, and rod, of the value of £3,635,558; 947,549 tons of railroad iron, of the value of £10,237,767; 33,665 tons of wire (other than telegraph), of the value of £974,743; 208,423 tons of hoops, sheets, and boiler and armor plates, of the value of £3,430,970; 2,364,684 cwt. of tin plates, of the value of £3,812,744; 299,614 tons of cast or wrought and all other manufactures (except ordnance unenumerated), of the value of £4,778,785; 108,181 tons of old iron for remanufacture, of the value of £961,931; 45,285 tons of steel, unwrought, of the value of £1,491,340; and 11,130 tons of manufactures of steel, or steel and iron combined, of the value of £314,842. The total export of iron and steel in 1872 averaged 282,385 tons per month; but the average was not attained after September.

At Middlesbrough and locality a firm feeling characterizes the iron trade, prices being about as follows: No. 3 pig iron, £5. 10s.; No. 1, 115s. to 117s. 6d.; No. 4, 105s. to 107s. 6d.; Angle iron, £12 to £13. 10s.; plates, £12. 15s. to £13. 5s.; rails, £10. 15s. to £11. 10s.; merchant bars, £11. 10s. to £12; puddled bars, £8. 5s. to £8. 15s. In Cumberland, and particularly at Barrow in Furness, shipbuilding is being greatly developed. Prices are No. 1 West Coast hematite pig, £9; No. 2, £8. 17s. 6d.; No. 3, £8. 15s.; No. 4, £7. 10s.; Bessemer pig same; common Cumberland manufactured iron, £12; best kinds, £12. 10s. to £13. 10s.; cable and rivets, £12; ship girders and tank plates, £14; boiler plates, £15; puddled bars, £9. to £9. 10s.; hematite ore at Ulverston, 10s. to 26s.; Bessemer steel rails, £14. to £14. 10s.; billets, £11. 15s. to £16; and blooms or ingots, £9 to £11. In Scotland the tone of the market is decidedly firmer warrants having got up as high as 127s. 9d. Pig, generally speaking, is stiffer, following being current rates: Gartsherrie No. 1, 147s. 6d.; No. 3, 125s. to 128s.; Coltness, No. 1, 27; No. 3, 26. 10s.; Summerlee, No. 1, 27. 2s. 6d.; No. 3, 26. 8s.; Carnbroe, No. 1, 26. 18s.; No. 3, 26. 10s.; Langloan, No. 1, 27. 10s.; No. 3, 26. 10s.; Calder, No. 1, 27. 7s. 6d.; No. 3, 26. 7s. 6d.; Glegarnock, No. 1, 26. 18s. 6d.; No. 3, 26. 10s.; Eglinton, No. 1, 26. 8s.; No. 3, 26. 5s.; Dalzell, No. 1, 26. 10s.; No. 3, 26. 7s. 6d.; Shotts, No. 1, 27; No. 3, 26. 7s. 6d.; Kinnell, No. 1, 26. 15s., and No. 3, 26. 5s. Should the colliers' strikes continue—as they appear likely to do in the districts enumerated in my last letter—Scotch makes of pig are likely to be no lower in price. The malleable iron trade shows an improvement.

From Wales there is no news—but such "no news" is far from being good news. The news we hear is not of the usual kind. It does not relate to what is "doing" in so and so, but concerns us all in a vast struggle, wherein hundreds—nay, thousands of weak men, women and children are being thrust against the hard wall of simple starvation. Since I last wrote 4000 men have struck at Downlans. Attempts have been made to settle the dispute amicably but without success so far. The masters will not give in. They say they are speaking the truth when they say their reasons for reducing wages 10 per cent, and they open their books to the inspection of their own men; but no arbitration, no interference from paid delegates, will they agree to. Good Mr. Crawshaw—owner of the gigantic Cyfarthfa works, and father of the Welsh trade—last week gave—or rather advanced, 10s. each to his married firemen, molders and puddlers, and 5s. each to the laborers, despite the fact that they are on strike against himself. The correspondents of your daily newspapers will, no doubt, have detailed the grim desolation, the pitiful starvation of the people, the deserted appearance of the once busy works, and other results of this disastrous strike. Its effects on trade in South Wales are absolutely prohibitive. Nothing is being done at any of the principal establishments, and, saving a lot of 300 tons of rails from Tredegar to Lisbon, with 1000 tons from Nantyglo and Blaenau to New Orleans during last week. I question if Wales is doing more business than the most primitive Saxon times when Rolf, of Hereford, fought off and hard against King Gryffeth, of the principality, for the sovereignty of the marshes.

It should nevertheless be understood that the colliers in the Vale of Heath, with one or two exceptions, are doing a very large business. The Baglan, Maysmarchog, Dyffrynman, Brithdu, Cromdu Graig and Seven Sisters collieries are fully engaged, but Cromavon is set down as stopped. In Monmouthshire the Sontypool (Varteg) men have returned to work at the old rate, and at Briton Ferry the strike has ended in a compromise, the men having agreed to be bound by whatever result is arrived at in the Cyfarthfa and Downlans districts. An attempt to settle the whole dispute by voting on the ballot system has found much favor, inasmuch as at an experiment, tried at Blaenau, a majority of 388 voted for the instant resumption of work. Many labor disputes, beside this great one in Wales, yet exist, amongst the number being these: miners in Ayrshire, Fifeshire and elsewhere in Scotland, tin-smiths at Paisley, gunlock filers at Darlington, a partial strike of stone-masons at Eston, (Cleveland), printers at Edinboro', and others. In the North of England the arbitrator is going through the iron masters books in the usual manner, in order to settle the price per ton to be paid to the puddlers during the next six months.

Last week I enumerated the list of subjects to be discussed at the Trades Union Congress held this year at Leeds. The congress having now performed its functions, further allusion may be made thereto. The proceedings opened on Monday, 150 delegates being present, representing about 700,000 trades unionists. Mr. Lishman, of Leeds, was appointed president. The report of the Trades Union Congress Parliamentary Committee was first read, the subjects dealt with being the new mining regulation act, the arbitration act, and several other Parliamentary measures specially relating to masters and workmen, or servants. The committee very emphatically condemned the criminal law amendment act, especially the clauses rendering breach of contract on the part of workmen punishable by imprisonment—of which the gas stokers' case was instanced as an abuse of criminal powers of which the government should take notice. Further, they ask for the repeal of the act; that there shall be no imprisonment for breach of contract; that the small penalties act be repealed, with other pointed remonstrances and suggestions. At the second sitting the chairman gave his address to the assembled "commons," touching upon the subject of strikes generically, on the mode of conducting them intelligently and successfully, with a mention of the Truck system of payment, and other matters of that nature. His *pseudo* parliament then devoted several hours to discussing its own standing orders, at the end of which time it was agreed to fancy they had been intuitively arrived at, no direct

evidence being forthcoming as to what was to be done until standing order No. 26, or thereabouts, had been read out. Finally, after much cogitation, it was decided to allow speakers ten minutes each, the reader of a paper twenty minutes, and mover of a resolution fifteen minutes. This being so, the remainder of the day was spent in discussing the Parliamentary Committee's report—alluded to above—which also formed the staple topic on the ensuing day. The criminal law amendment act came in for unrestricted condemnation, and it was resolved to leave no stone unturned in order to secure its repeal, fully and unconditionally. This course was also recommended by Mr. Carter, M. P. for Leeds, a thorough-going, outspoken radical. You would, I think, term him republican in the States. The Congress was afterward addressed by this gentleman and the Honorable Auberon Herbert, who is also a youthful aspirant to fame along the republican platform, and who is at present one of the representatives in Parliament of Nottingham. The Congress resolved to petition both houses of Parliament for an immediate repeal of the factory acts, or such portion of them as shall reduce the legal term of labor of young persons and women from 60 to 54 hours per week, it being shown by the bills of mortality that the death rate amongst the factory population (the bulk of which is composed of women and young persons) is greater than of any other class in the kingdom. The next resolution was unanimously passed, adopting the report of the committee in its entirety, condemnatory of the Truck system. On the evening of this (the third) day, a public meeting was held in the Town Hall (which your readers, or perhaps many of them, know to be about the finest town hall in England), at which, Mr. Alderman Carter, M. P., of Leeds, presided. That gentleman delivered a political speech, agreeably mixed with pungent trades union sentiments, in which he urged them to put forward and support at the next general election, candidates of their own. A resolution to that effect was adopted by a well attended meeting, and another resolution mildly rebuked Mr. Justice Brett, agent the gas stoker business. I don't need to say to you that in this country pretty nearly all public, political, or social agitation is worked out by petitions and public meetings. Public meetings are particularly suited to the disposition of the average Englishman. He goes, sits through, and under the speeches, holds up his hand *pro* or *con*, and goes home contented. Despite this seeming fair play and quiet orderly method of agitating, it is a well recognized truth that a public meeting can be made to carry anything on to success, or to blast the hopes of the fairest project ever launched into the troubled atmosphere of politics. It is simply a question of packing and well-conducted wire pulling. Not that there is anything akin to what is popularly known as "American jobbery" here. By no means! That is—well, it is best not to say too much on that point, amongst others, such things have been whispered even in the land of the queen and the pride of the ocean. As I have already said, the meeting passed resolutions in favor of the union principles. Next day, Mr. Geo. Potter, a fellow worker in the good cause of republicanism, with the good man George Odger, both being Londoners, read a paper entitled, "Trades unions from a national point of view." Amongst other statements, the reader estimated that the import and export trade of the country has risen in value from £268,000,000 in 1854 to £610,000,000 in 1872, and he believed the annual wealth of the country to be £820,000,000. With respect to the great strike in South Wales, the delegates resolved, on the motion of Mr. Geo. Odger (who is a very old trades unionist), "to give every possible support to the men on strike, believing that the refusal of the masters to submit to arbitration is proof of the untenable nature of the position assumed by them." The Congress did not, despite the long programme, lose sight of the poor agricultural laborers, but, on the contrary, had a paper read to them by Mr. Arch (of Warwick), leader of the laborers' movement, on the fifth day of their sitting, its subject being on the employment of women and children in agricultural factories and workshops, and the employment of soldiers in industrial trades and as agricultural laborers. A resolution, approving of Mr. Arch's views as expressed, was passed. Then came the question of a *venue* for the Congress next year, the choice ultimately settling itself upon Sheffield by a large majority of votes.

Finally, or rather as a sort of penultimate proceeding, Mr. R. Marsden Latham (president of the Labor Representation League) read a paper on the representation of labor in Parliament, a step advocated strongly by the writer, who mentioned, as part of the "platform," that election expenses ought not to be borne by the candidates, and that M. P.'s ought to be paid salaries during the time they are acting as representatives. The subjects talked over on the sixth and last day were those relative to the "good from oven" system which prevails in the potteries, the arbitration act, the limitation of apprenticeship (against which proposal a resolution was passed), piece work (approved of) and convict labor, which was condemned unanimously as being unfair to the trades against which prisoners are employed to compete. The last resolution passed by the Congress was one advocating the principle of international arbitration and the establishment of a tribunal for dealing with all questions coming within its scope. The Congress then dissolved and next year will meet at Sheffield. The metal market has been rather particularly active this week, but prices have been tolerably steady, and, in the case of tin, have advanced. Copper is steady as regards English, but rather weaker as to foreign sorts. Chili was in good demand in the early part of the week, at £90 to £91. 10s., according to brand and prompt, but since receded to £88 to £88. 10s. cash. On Thursday, Chili bar was done in London at a slight improvement, £89 to £89. 10s., and Valparaiso, which had previously touched £85, at £86. Tin has been in rather active demand at an advance. On Wednesday, Straits sold for cash at £143 to £143. 10s., and a small lot at £144, and on the following day realized £144 to £144. 10s. Spelter is firm and advancing, in sympathy with Continental quotation. Silesian is now £24; special brands £24. 2s. 6d. to £24. 7s. 6d.; W. H. L., £25. 2s. 6d.; Rhensish, £24, both in London and outports; English, £24. 10s. to £25, according to brand. Tin-plates are in fair request at full rates, and lead is very firm, at £22 to £22. 5s.

I have to report another heavy crop of failures this week. They include the mercantile house of Wetherell, Quintas & Co., in the Spanish and Canary trade, whose suspension is attributed to the stoppage of other firms whose paper they held—liabilities £150,000; Mr. M. B. Shuman, of Bridge Wharf, Bankside, engaged in the shipping and general trade to America, whose liabilities are £200,000, and whose suspension is attributed to the late crisis in New York; Messrs B. Powell, Sear & Co., silk merchants, 7 Great Winchester Street Buildings, with liabilities stated to be £150,000, the main portion of which is covered by the security of silk; and Messrs Heltz & Devezze, in the silk trade, with liabilities amounting to £400,000, and assets depending very much upon the course of the silk market.

On the other hand, it is announced that Mr. Pigou (Pigou & Wilkes), of 34 Throgmorton street, and Darford Powder Works, who suspended payment in September last with liabilities of £100,000, unsecured, has arranged to pay his creditors in full.

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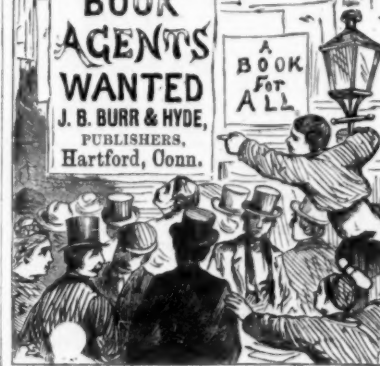
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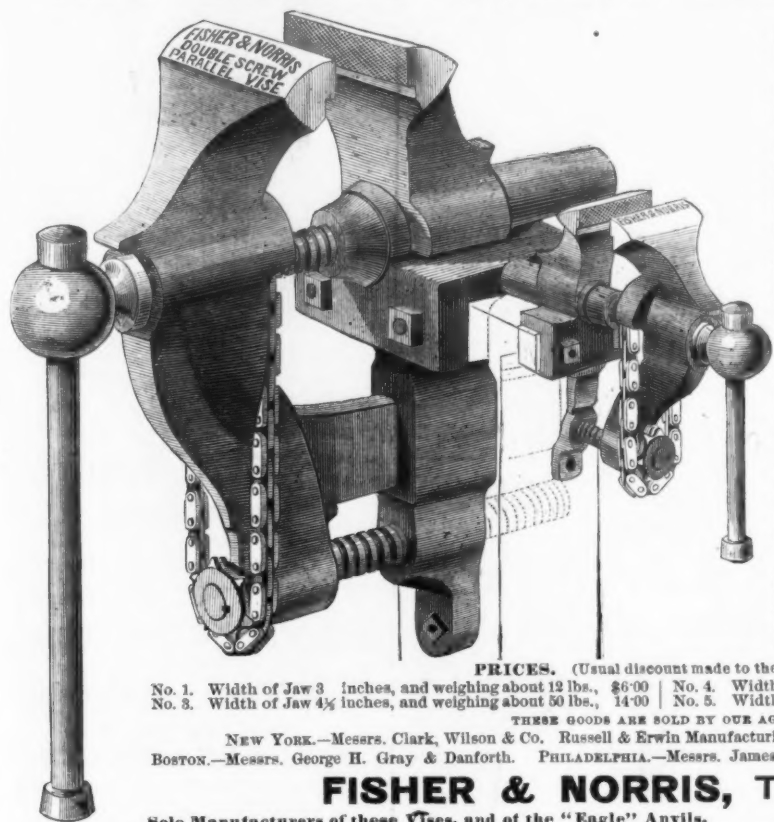
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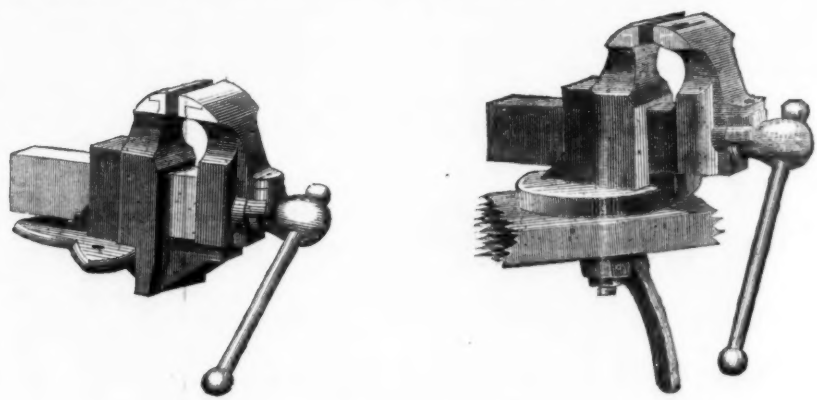
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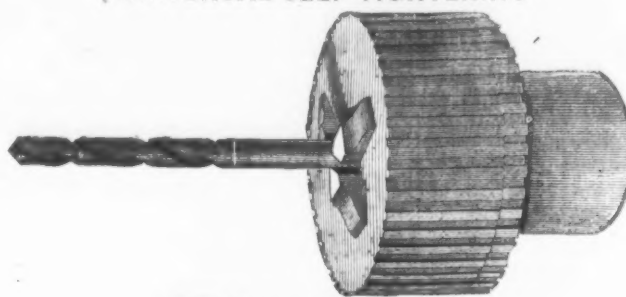
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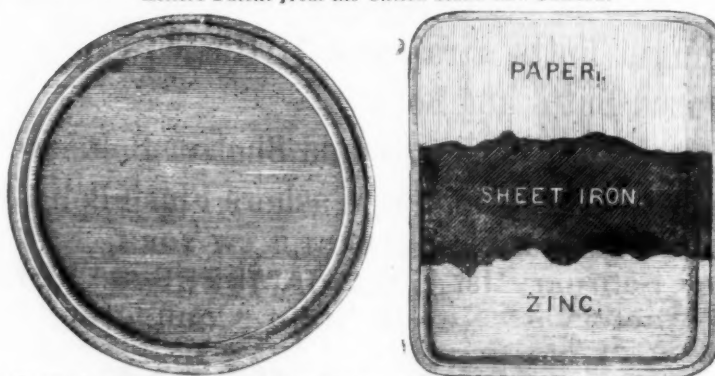
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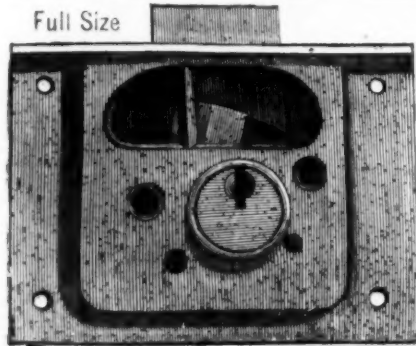
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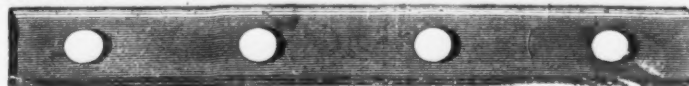
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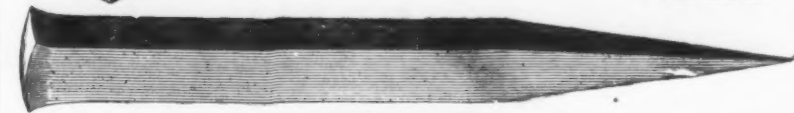


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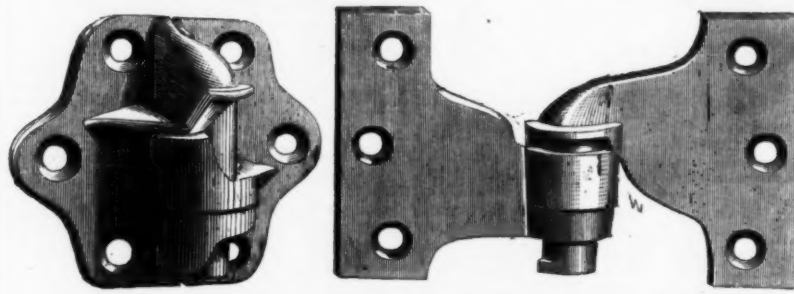
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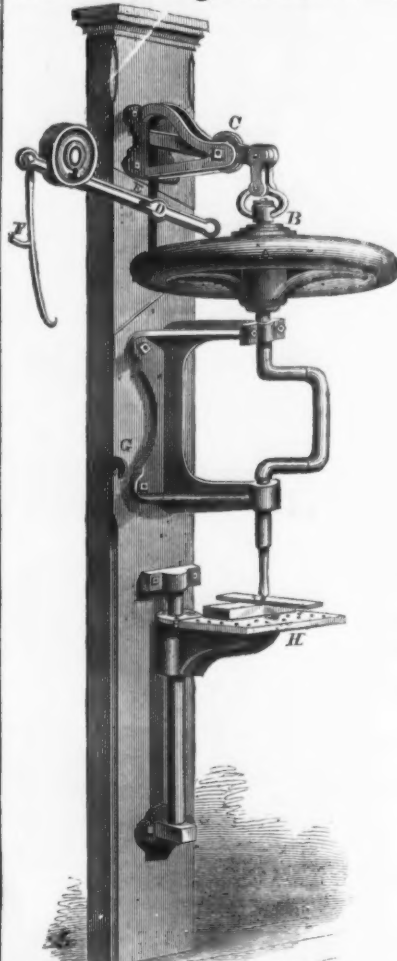
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" 63..... " 64..... " 65..... " 66..... " 67..... " 68..... " 69..... " 70..... " 71..... " 72..... " 73..... " 74..... " 75..... " 76..... " 77..... " 78..... " 79..... " 80..... " 81..... " 82..... " 83..... " 84..... " 85..... " 86..... " 87..... " 88..... " 89..... " 90..... " 91..... " 92..... " 93..... " 94..... " 95..... " 96..... " 97..... " 98..... " 99..... " 100.....</p>	<p>Whitney & Wain's Bronze Metal..... Caps—Perussion per 1000..... G. D..... Ely's E. B..... " Double Waterpump, 1-1/2, 67 1/2; 1-10, 75c, gold " 1-18, 82 1/2; 1-10, 90c, gold</p> <p>Cartridges. Metallic..... Horse and Curry..... Cotton and Wool..... Casters. Iron and Wood Wheel Plate..... Brass Wheel Plate..... Porcelain Wheel Plate..... Chain—By the Case. English Coil..... " 3-16..... " 3-16..... Trace, 6 1/2-10-2..... Trace, 7-10-2..... Galvanized Pump Chain..... German Halter Chain..... German Coil..... Jack Chain, Iron..... " Brass..... Chalk. White..... Red..... Blue..... Crayons..... Chisels. 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Cole..... Pearce, No. 2..... Mauvill, No. 2..... Knorr, with 4-inch Roll..... O. K..... Excelsior, No. 1..... Diamond.....</p>	<p>Emery..... No. 1, 7-inch Roll..... No. 2, 5-inch Roll..... K. F. M., 4 1/2 inch Roll..... 6-inch Roll..... Carpenter's Self-Heating..... Fairly, Self Heater..... National, 3-inch Rolls..... Meyer's Fashion Fluter, 4 1/2 inch Rolls..... Fry Pans. Timed..... " 3-20 3-25 3-32 4-01 4-50 5-00 5-50 6-00 6-50 7-50 No..... Peck, Stow & Wilcox..... Smith, Burns & Co., "Excelsior" Polished..... " 3-70 4-00 4-70 5-30 6-00 7-00 8-00 9-00 per doz. No. 1 2 3 4 5 6 7 8..... Hammers. Maydole's..... Cheney's..... Verree..... Yerks & Plumb..... Emmet Hammer Co..... Handles. Hammer and Hatchet..... Quakertown, Axe, Pick and Sledge..... Hammer and Hatchet..... Harness Snaps. Judd's..... Fitch's..... Hatchets. Isiah Blood..... Shingling, Nos. 1 2 3..... Claw..... Lathing..... Hunt's..... Shingling, Nos. 1 2 3..... Claw..... Lathing..... Hunt's..... Shingling, Nos. 1 2 3..... 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No. 44	0.62 0.66
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No. 48	0.70 0.74
No. 49	0.72 0.76
No. 50	0.74 0.78
No. 51	0.76 0.80
No. 52	0.78 0.82
No. 53	0.80 0.84
No. 54	0.82 0.86
No. 55	0.84 0.88
No. 56	0.86 0.90
No. 57	0.88 0.92
No. 58	0.90 0.94
No. 59	0.92 0.96
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No. 62	0.98 1.02
No. 63	1.00 1.04
No. 64	1.02 1.06
No. 65	1.04 1.08
No. 66	1.06 1.10
No. 67	1.08 1.12
No. 68	1.10 1.14
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No. 70	1.14 1.18
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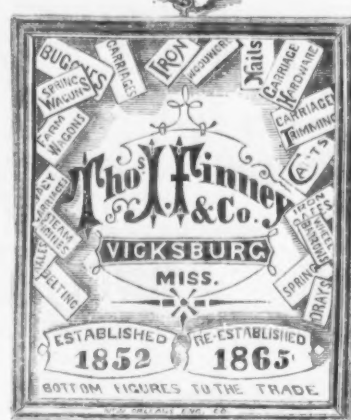
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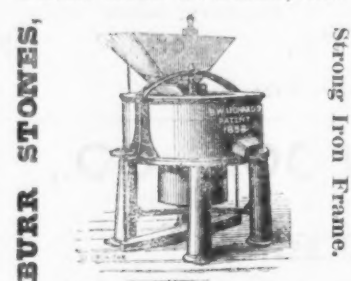
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 11:00 A. M. Express Mail for Buffalo and Niagara Falls. Drawing Room Coach to Susquehanna and Sleeping Coaches to destination.
 5:30 P. M. Night Express. Sleeping Coaches to Buffalo and Niagara Falls.
 7:00 P. M. (Daily) Cincinnati and Chicago Night Express. Sleeping Coaches through to Cincinnati, Buffalo, Niagara Falls, and thence to Chicago.
 Additional Trains leave for:
 Newark, 6:30, 8:45 and 11:30 A. M., and 3:15, 5:15 and 6:30 P. M.
 For Port Jervis, 8:00, 9:00, 11:00 and 11:15 A. M., 4:30, 5:30, 10:30 and 11:00 P. M.
 For Goshen and Middletown, 7:30, 8:00, 10:30, 11:00 and 11:15 A. M., 3:30, 4:30, 5:30, 10:30 and 11:00 P. M.
 For Warwick, 8:00, 11:00 and 11:15 A. M., 4:30 P. M.
 For Newburgh, 8:00, 10:30, 9:00 and 11:00 A. M., 3:30, 4:30 and 5:30 P. M.
 For Suffern, 7:30, 8:00, 10:30, 11:00 and 11:15 A. M., 3:30, 5:00, 10:30, 7:00 and 11:30 P. M.
 For Ridgewood, Hohenus, Alendale, and Ramsey's, 7:30, 8:00, 10:30, 11:00, 11:15 A. M., 3:30, 5:00, 6:00, 10:30, 7:00 and 11:30 P. M.
 For Paterson, 6:45, 7:30, 8:00, 10:30, 11:00, 11:15 A. M., 12:00 M., 1:45, 3:30, 4:00, 5:00, 5:15, 5:30, 6:00, 10:30, 7:00, 10:30 and 11:30 P. M.
 For Rutherford Park and Passaic, 6:45, 7:30, 10:30, 11:00 A. M., 12:00 M., 1:45, 3:30, 4:00, 5:15, 5:30, 6:00, 8:00, 10:30 and 11:30 P. M.
 For Hackensack and Way, 5:00, 8:15 and 10:45 A. M., 1:00, 4:00, 5:00 and 6:00 P. M., and Saturdays only, 12:00 midnight.
 For Hillside and Way, 5:00, 8:15 and 10:45 A. M., 1:00, 4:00, 5:00 and 6:00 P. M., and Saturdays only, 12:00 midnight.
 For Spring Valley and Way, 5:00, 8:15 and 10:45, and 1:00 A. M., 1:00, 4:45, 5:00 and 6:00 P. M., Saturdays only 12:00 midnight.
 For Englewood, 5:00, 7:45, 9:00 A. M., 1:30, 3:15, 4:15, 4:45, 5:30, 6:30 and 7:45 P. M. Saturdays only, 12:00 midnight.
 For Cresskill, 5:00, 7:45, 9:00 A. M., 1:30, 3:15, 4:15, 5:00, 6:30 and 7:45 P. M. Saturdays only, 12:00 midnight.
 For Upper Piermont, 5:00, 7:45, 9:00 A. M., 1:30, 4:15, 4:45, 5:30, 6:30 and 7:45 P. M. Saturdays only, 12:00 midnight.
 For Piermont and Nyack, 7:45 and 9:00 A. M., 1:30, 4:15, 4:45, 5:30, 6:30 and 7:45 P. M. Saturdays only, 12:00 midnight.
 N. B.—Trains leaving Chambers street on even hours or half hours leave 23d street fifteen minutes earlier than above time. The 5:00 A. M., 10:00 and 11:30 P. M. Trains start from Chambers Street only.
 N. B.—Trains on the N. Y. R. R. and Newark Branch leaving Chambers street on quarter hours, leave 23d street thirty minutes earlier than above time.
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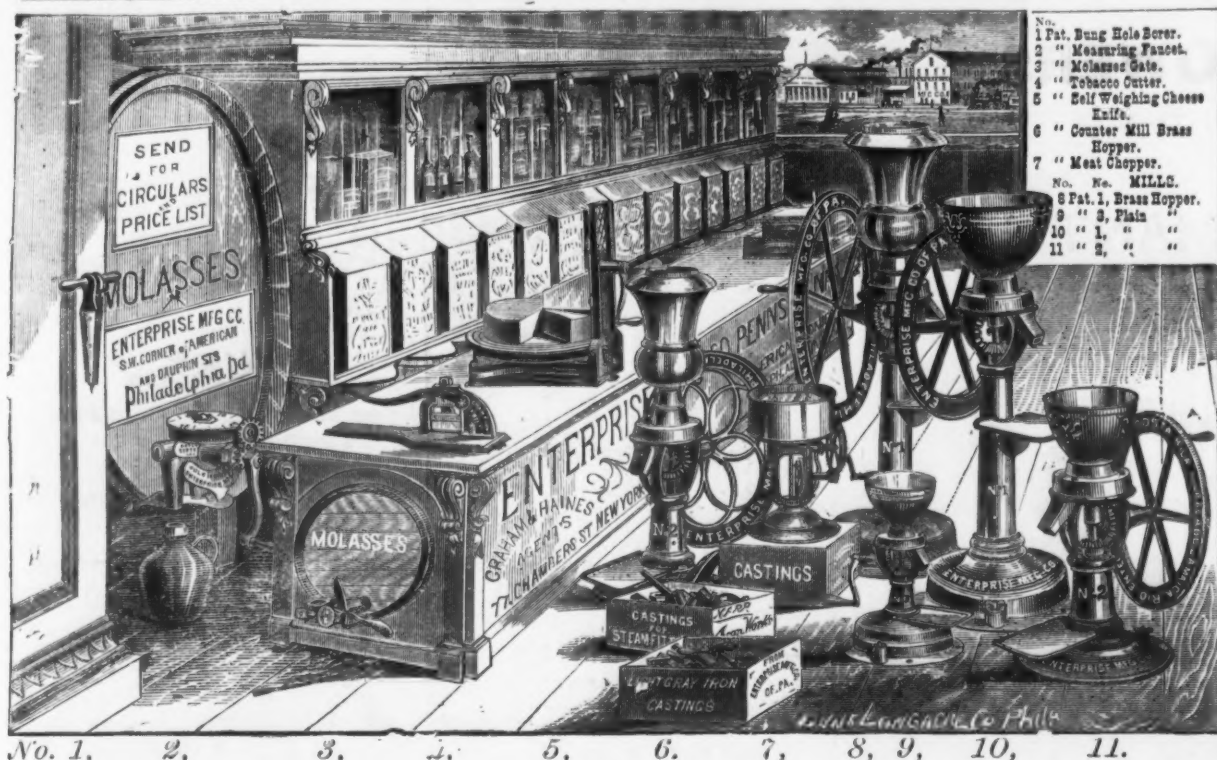
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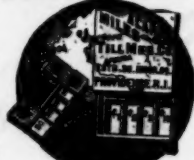
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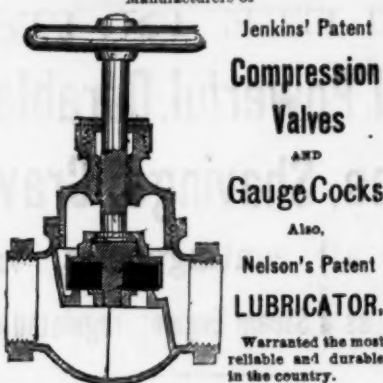
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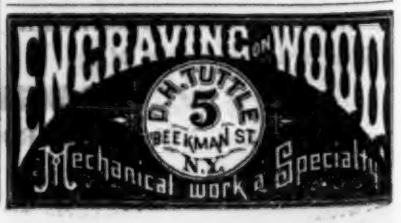
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Steel.

THREE
1st CLASS PRIZE MEDALS.
CLASSES 1, 21, 22,
Great Exhibition of Industry,
LONDON, 1851.

MEDAL OF HONOUR,
SOCIETY OF ARTS & INDUSTRY,
LONDON, 1856.

1st CLASS
PRIZE MEDAL, CLASS 14
UNIVERSAL
EXHIBITION OF INDUSTRY
PARIS, 1855.

COCKER BROTHERS

SUCCESSORS TO
SAM'L COCKER & SON,
(Established 1752.)
SHEFFIELD, ENGLAND

MANUFACTURERS OF
CAST, SHEAR, SHEET, AND BLISTER STEEL, OF EVERY DESCRIPTION.
BEST CAST STEEL WIRE, ADAPTED SPECIALLY FOR MECHANICAL PURPOSES;
Also for ROPES, NEEDLES, FISH HOOKS, PINS, CRINOLINE, &c.

BEST CAST STEEL FILES, SAWS, EDGE TOOLS,
HACKLES, GILLS, CARD CLOTHING, CARD TEETH, HACKLE AND GILL PINS,
FISH HOOKS, NEEDLES, &c.

ALSO

GENERAL MERCHANTS.
Agent, JONATHAN HATTERSLEY, Cincinnati, Ohio

WM. JESSOP & SONS,

MANUFACTURERS OF
STEEL,
AND IMPORTERS OF IRON,
SHEFFIELD, ENGLAND.

PRINCIPAL DEPOTS:
NEW YORK, Nos. 91 and 93 John Street. BOSTON, Nos. 133 and 135 Federal Street.
AGENCIES:
PHILADELPHIA, Jas. C. Hand & Co. PROVIDENCE, Cornett, Nightingale & Co.
CHICAGO, Crerar, Adams & Co. ST. LOUIS, Henry Bakewell & Sons.
CINCINNATI, Augustus Wessel. NEW ORLEANS, Folger & Co.
SAN FRANCISCO, Russell & Erwin Manufacturing Co.

F. W. MOSS,

Successor to JOSHUA MOSS & GAMBLE BROTHERS,
MANUFACTURER AND IMPORTER OF
STEEL AND FILES.

Principal Depots: 80 John Street, New York, and 512 Commerce Street, Philadelphia.
MOSS & GAMBLE SUPERIOR C. S. "FULL WEIGHT" FILES,
Cast Steel Hammers and Sledges. Also, "M. & G." Anvils and Vises.
WARRANTED CAST STEEL, especially adapted for DIES and TURN-
PUNCHES, and all kinds of MACHINIST'S TOOLS.
Celebrated Improved Mild Centre Cast Steel, for Taps, Reamers, and Milling Tools,
warranted not to crack in hardening Taps of any size.
Swede Spring Steel, especially adapted to Locomotive and Railway Car Springs.
English Spring and Plow Plate Steel.
Also, manufacturer of
Sheet Cast Steel, Shear, German, Round Machinery, Hammer, Fork and Shovel Steel
And GENERAL MERCHANT.
A. M. F. WATSON, General Agent.

WILSON HAWKSWORTH, ELLISON & CO.,

MANUFACTURERS OF
STEEL, STEEL WIRE, &C.,
AND GENERAL MERCHANTS,
CARLISLE WORKS, SHEFFIELD, ENGLAND.

AGENCIES:
New York, 72 John Street.
Philadelphia, 505 Commerce Street.
Boston, 6 and 8 Liberty Square.

BARROW HEMATITE STEEL COMPANY,

LIMITED.
BARROW IN FURNESS,
LANCASHIRE, England
MANUFACTURERS OF
STEEL RAILS, TYRES, WHEELS,
Axles, Shafting, Boiler and Ship Plates, Bessemer Pig Iron, &c., &c.
CHAS. CONGREVE & SON,
SOLE AGENTS FOR THE U. S.,
104 and 106 John Street, opposite Cliff Street, NEW YORK.

J. & RILEY CARR,

MANUFACTURERS OF SUPERIOR
STEEL
For Tools, Cutlery, Saws, Files, Augers, Gimblets, &c.; Sheet Cast Steel for
SPRINGS AND STAMPING COLD;
ALSO THE CELEBRATED
DOG BRAND FILES,
Unsurpassed, if equaled, in quality.
Balley Lane Works, Sheffield, England.
Warehouse, 82 John St., New York.
Established 1810.
HENRY MOORE, Attorney.



Steel.

SANDERSON BROTHERS & COMPANY,

(LIMITED)
MANUFACTURERS OF THE
CELEBRATED CAST STEEL,
WARRANTED MOST SUPERIOR FOR TOOLS.

DARNALL WORKS,
ATTERCLIFFE FORGE,
WEST STREET WORKS,

SHEFFIELD, ENGLAND.

IMPORTERS OF FILES,

AND
AGENTS FOR ARMITAGE'S GENUINE MOUSEHOLE ANVILS.
NEW YORK, Edward Frith, 16 Cliff. NEW ORLEANS, Rich'd Rhodes, 71 Camp.
BOSTON, H. L. Richards, 18 Battery March. BALTIMORE, Md., Wm. H. Cole.
PHILADELPHIA, Wm. H. Sowers. MONTREAL, Saint Paul St.
CLEVELAND, O., Cleveland, Brown & Co. NEW HAVEN, Ct., Atwater, Wheeler & Co.

FRANCIS HOBSON & SON,

97 John Street, NEW YORK,
Sole Manufact'rs of "CHOICE" Extra Cast Steel.
Manufacturers of all Descriptions of Steel.
Manufacturers of Every Kind of Steel Wire.
Don Works, Sheffield, England.
JOHN HOGAN, Agent.

S. & C. WARDLOW,

MANUFACTURERS OF THE CELEBRATED
**Cast and Double Shear
STEEL,**

In Bars, Sheets and Coils, for fine Pen and Pocket Cutlery, Table, Carving,
Butcher and Shoe Knives, Turning Tools, Dies, Files, Clock or other Springs,
Saws and Tools of every variety.

SHEFFIELD, ENGLAND.

Office of S. & C. WARDLOW, 13 Gold Street, New York.

In calling the attention of consumers of Steel in any of the various above enumerated uses, we would respectfully assure them of our ability to supply an article that cannot be equalled in quality, temper, and adaptation in all respects to the various purposes for which it may be required. With a century of practical experience in all departments of Steel manufacture, a long established reputation in England, and the Command of Europe, and in the Eastern States principally of this Country, we are enabled to select a universal trial of our Steel for the above or other purposes for which a first class material in quality, temper, and durability is needed.

G. SANDERSON & CO.,

Manufacturers of all descriptions of
STEEL.

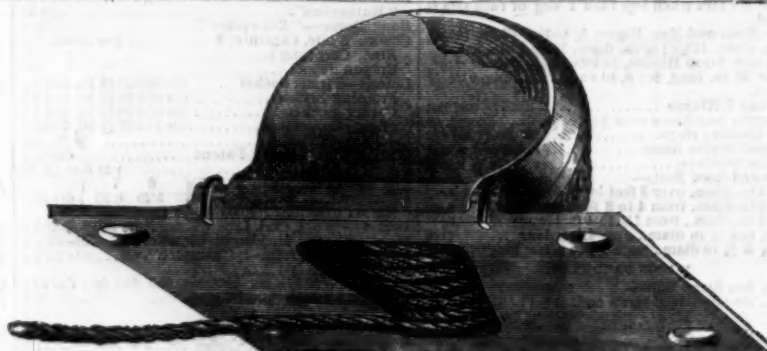
Balley Street and Broad Lane Steel Works, SHEFFIELD, ENGLAND.
Particular attention is paid to quality and temper for
Files, Saws, Table and Pocket Cutlery, Augers, Shovels, &c.
ALSO STEEL of superior quality for Turning Tools, Taps, Dies, Drills, &c.
Hot and Cold Rolled Sheets for Clock Springs, Corset Clasps, Pens, &c.
Makers of the Celebrated ROCK BORING DRILL STEEL.
Warehouse, 96 John Street, New York.

A. J. NELLIS & CO., Pittsburgh, Pa.

Agricultural Steels
and Irons
OF ALL KINDS AND SIZES.
REVELED, BOLTED, FIT-
TED AND TEMPERED TO
SUIT ALL KINDS OF SOIL.

Nellis' Original Harpoon Horse Hay Fork Improved.
Nellis' Grapple & Pulleys.
Send for Pamphlet.

With the exception of our Horse Hay Fork and Fittings we make no complete implement. Agricultural Steels and Irons we make a specialty. From the universal approval our goods have secured by actual test in the hands of Implement Makers and Farmers from the Atlantic to the Pacific, and with our facilities, experience and improvements, we frankly assure the Trade of our ability to meet the requirements of the age. All of our Steel Goods have imprint of our Trade Mark.



THE ANDERSON SASH BALANCE
Supersedes Weights and Boxes.
Is a perfectly even Balance at all points. Is Neat, Simple, Durable and Cheap. Can be placed in any window at any time. Is noiseless and obeys the slightest touch. Is easily applied and will not get out of order. Facilitates cleaning of windows. Recommends itself.
Anderson Balance Manufacturing Co.,
Twenty-Ninth and Railroad Streets, PITTSBURGH, PA.
To be used at No. 70 Smithfield Street.

Steel.

Sheffield Steel Works.

(Established in 1848.)
SINGER, NIMICK & CO.

Pittsburgh, Pa.,
Manufacturers of Extra Quality Tool
CAST STEEL,
Patent Rolled
SAW PLATES,
All descriptions of Cast and German
Spring and Plow Steel
Elliptic and Side Springs, Seat Springs,
AXLES, STEEL TIRE,
Plow Wings, Shares, Cultivators,
Reaper Bars, Crow Bars, &c., &c.
Warehouse, 83 Water and 100 First Streets.

ISAAC JENKS,
Minerva Iron & Steel Works,
Wolverhampton, England,
MANUFACTURER OF
"Jenks' Spring Steel," and Cast
Spring Steel,
Also, TIRE, TOE CORK, SLEIGH SHOE, BLISTER
AND PLOW STEEL.
VAN WART & MCCOY,
SOLE AGENTS,
43 Chambers St., New York.
A full assortment of "Jenks' Spring Steel," in stock.

MILLER, BARR & PARKIN,
Crescent Steel Works,
PITTSBURGH, PA.,
Manufacturers of all descriptions of
STEEL
EQUAL TO ANY IN THE MARKET.
Office.....339 Liberty St.,
PITTSBURGH, PA.

Gunpowder.

GUNPOWDER.

DUPONT'S
Sporting, Shipping, and Mining
POWDER.

DUPONT'S GUNPOWDER MILLS,
ESTABLISHED IN 1801,
Have maintained their great reputation for 70 years. Manufacture the
Celebrated Eagle Ducking, Eagle Rifle
and Diamond Grain Powder.
Also, SPORTING, MINING, SHIPPING, AND BLAST-
ING POWDER
of all kinds and descriptions.
For sale in all parts of the country. Represented by
F. L. KNEELAND,
70 Wall Street, NEW YORK.

GUN-POWDER

LAFLIN & RAND POWDER CO.,
21 Park Row, New York,
invite the attention of the the Hardware Trade to
their facilities for delivering
**BLASTING, MINING and RIFLE
POWDER**

IN EVERY PART OF THE UNITED STATES,
from having agencies and magazines at all prominent
points, beside our works at
Newburg, Saugerties, Kingston, and
Catskill, N. Y.; Scranton, Carbon-
dale, and Pottsville, Pa.; Balti-
more, Md., and Plattsville, Wis.
The superiority is well known of our brands
Rifle Powder:
Orange Rifle, Orange Ducking
Lightning, Audubon.
SAFETY-FUSE at wholesale.

Steel.

HUSSEY, WELLS & CO.

MANUFACTURERS OF ALL DESCRIPTIONS OF

CAST STEEL,

INCLUDING

Best Refined Steel for Edge Tools.

PARTICULAR ATTENTION PAID TO THE MANUFACTURE OF STEEL FOR

Railroad Supplies, Homogeneous Plates

FOR LOCOMOTIVES, BOILERS AND FIRE BOXES,

Smoke-Stack Steel, Cast Steel Forgings for Crank Pins, Car Axles, &c.

ALSO, MANUFACTURERS OF THE CELEBRATED BRAND

"Hussey, Wells & Co. Cast Spring Steel,"

For Elliptic Springs for Railroad Cars & Locomotives.

PENN AND SEVENTEENTH STS., PITTSBURGH, PA.

BRANCH OFFICES:

30 Gold St., New York. 139 & 141 Federal St., Boston. 88 Michigan Ave., Chicago.

Pittsburgh Steel Works

ESTABLISHED IN 1845.

ANDERSON & WOODS,

MANUFACTURERS OF

BEST REFINED CAST STEEL,

Cast and German Plow and Spring Steel,

FIRST AVE. AND ROSS ST., PITTSBURGH.

BRANCH HOUSES:

Nos. 74 and 75 North Street, Boston. C. H. WHITNEY & SON, 143 Greenwich Street, New York.

W. F. POTTS, SON & CO., 123 Market Street, Philadelphia.

First Prize awarded at Fair of American Institute, 1870.

CHROME STEEL COMPANY,

MANUFACTURERS OF BEST

CAST STEEL,

WARRANTED SUPERIOR TO ANY STEEL IN THE MARKET—EITHER ENGLISH OR AMERICAN—

FOR EVERY PURPOSE.

Works and Offices—Kent Avenue and Keap Street, Brooklyn, E. D.

W. W. WOOD, President. C. P. HAUGHIAN, Superintendent.

JOHN A. CRISWOLD & CO.,
Troy, N. Y.

J. A. CRISWOLD. E. CORNING. E. CORNING, JR. C. CRISWOLD.

Rensselaer Iron Works, Fort Edward Blast Furnace, Bessemer Steel Works, And Columbia Blast Furnace.

MANUFACTURERS OF

Pig Iron, Railroad Iron, Merchant and Ship Iron,

BESSEMER STEEL RAILS, AXLES, TIRES, SHAFTING,

PLATES AND STEEL FORGINGS OF ALL DESCRIPTIONS.

New Jersey Steel and Iron Company.

Trenton, N. J.,

Represented by COOPER, HEWITT & CO., 17 Burling Slip, New York,

MAKERS OF

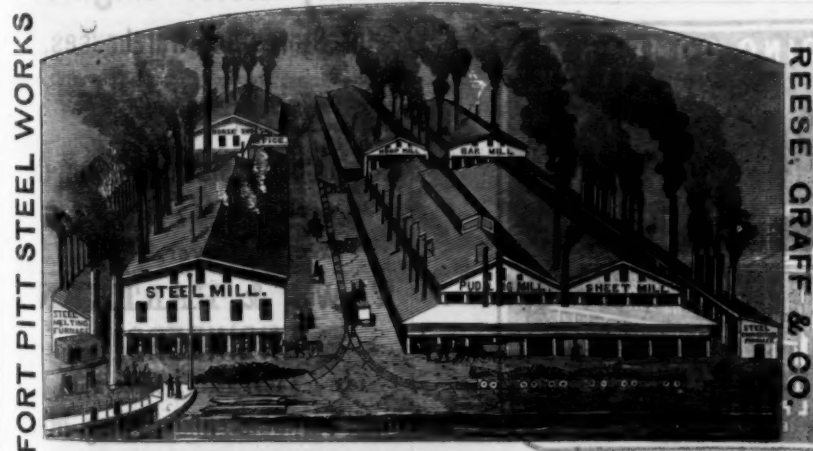
ROLLED IRON BEAMS.

Channel Bars, the Trenton Steel Top Rails, &c., &c. Refined Iron, Brazier and Wire Rods.

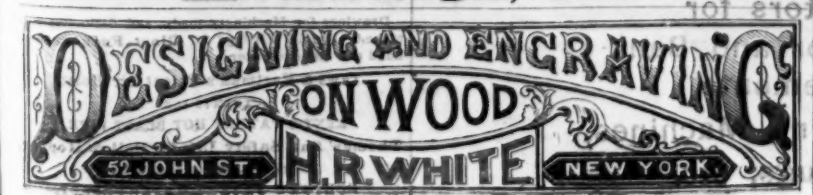
ALSO,

THE MARTIN STEEL,

For Machinery Uses and Fire-Box Plates.



Pittsburgh, Pa.

DESIGNING AND ENGRAVING
ON WOOD
H. R. WHITE
52 JOHN ST. NEW YORK

Chicago Metal Market.

(Reported by Cragin Bros. & Co., 141, 143 & 145 Lake street.)

CHICAGO, Dec. 2, 1872.

TIN PLATE.

IC, 10x14, Coke.	\$13 00
IC, 10x14, Charcoal.	14 00
IX, 10x14.	17 00
IC, 12x12, Coke.	14 50
IC, 12x12, Charcoal.	14 50
IX, 12x12.	17 50
IC, 14x30, Coke.	15 00
IC, 14x30, Charcoal.	15 00
IX, 14x30.	18 00
IXXX, 14x30.	21 00
IXXX, 14x30.	24 00
IXXX, 14x30.	27 00
IX, 14x14.	28 50
IX, 100 Plate.	17 00
IX, 100 Plate.	20 00
IX, 100 Plate.	23 00
IX, 100 Plate.	26 00
IX, 100 Plate.	29 00
IX, 100 Plate.	32 00
IX, 100 Plate.	35 00
IX, 100 Plate.	38 00
IX, 100 Plate.	41 00
IX, 100 Plate.	44 00
IX, 100 Plate.	47 00
IX, 100 Plate.	50 00

LARGE, 60 LB.

Small, 30 lb.

Ber Tin.

In casks 1000 lbs.

In sheets.

Slab.

Copper Bottoms.

Sheathing Copper.

Planned Copper 14x30.

Size, 14x30, 14x30, 14x30.

Nos. 7 8 9.

6 to 8 lbs.

10 and 12 lbs.

15 to 100 lbs.

Ingot Copper.

Bolt Copper.

FINE, C. B. & CO.'S BRAND.

Ordinary.

Plumbers' Solder, No. 1.

ANTIMONY.

BABBITT METAL.

GALVANIZED IRON CONDUCTOR PIPE, PER LB.

SHEET IRON.

Common. Smooth. Charcoal.

No. 14 to 24.

25 & 30.

27.

Add 1/2 c per lb for 30 in. wide.

No. 16 to 20.

" 21 to 24.

" 25 & 26.

" 27.

Discount, 30 per cent.

RUSSIA IRON.

Perfect, all numbers.

In sheets, 1c higher.

A.

B.

In sheets, 1c higher.

1/2 inch, 10 ft. long, per lb.

8-16.

Fig.

Bar.

Lead Pipe, in full coils.

when cut.

Sheet Lead.

CINCINNATI.

Reported by Seltzer & Co., Importers and Jobbers of Metals, No. 214, 216 and 218 Main street.

TIN PLATE.

I. C. 10x14 Charcoal.

I. C. 10x14 best Coke.

I. C. Terme, 14-20.

I. C. 30-25.

I. C. Continuous.

Pig Tin, Banca.

Strait.

English.

S. & Co.

A 1.

Roofing.

Pig.

Bar.

Ingots.

Planned.

Sheathing.

Bolt.

Brazier, 6 to 9 lb.

10 to 14 lb.

14 to 100 lb.

Copper Bottoms.

ZINC.

Cask, 500 to 1000 lbs.

Cask, 100 lb.

Slab.

Roll, No. 6 to 30.

" 30 to 38.

" 38 to 40.

Wire.

" 20 to 25.

Seltzer & Co.

Black Lead.

Market.

ANTIMONY.

BIENMUTH.

NICKEL.

PIG IRON.

Hot Blast Charcoal.

Hanging Rock No. 1.

" No. 2.

Tennessee No. 1.

Forge.

Alabama No. 1.

Missouri No. 1.

Stonewall No. 1.

Missouri No. 1.

Ohio No. 1.

Forge.

Scotch Pig No. 1.

Cold Blast Charcoal.

Hanging Rock Car Wheel.

Missouri Car Wheel.

Red River Car Wheel.

Tennessee.

Alabama.

Russia.

Am. Russia.

Smooth.

Com. B. Fin. S. L. U. D. Re'd.

15 to 20.

20 to 25.

25 to 30.

30 to 35.

35 to 40.

40 to 45.

45 to 50.

50 to 55.

55 to 60.

60 to 65.

65 to 70.

70 to 75.

75 to 80.

80 to 85.

85 to 90.

90 to 95.

95 to 100.

100 to 105.

105 to 110.

110 to 115.

115 to 120.

120 to 125.

125 to 130.

130 to 135.

135 to 140.

LEADER ELBOWS—FLAT CRIMP RETINED.

per doz.

2-inch.

3-inch.

4-inch.

Sheet Iron Broad Pans.

American Broilers.

Timmen's Machines.

Sad Irons.

Brass Kettles.

Inside Diameter.

Wrought Iron Pipe.

Weights of Pipe.

Per Foot.

Per Foot.

Per Foot.

Per Foot.

Per Foot.

Per Foot.

Per Foot.

Per Foot.

Per Foot.

Per Foot.

Per Foot.

Per Foot.

Per Foot.

Per Foot.

Per Foot.

Per Foot.

Per Foot.

Per Foot.

Per Foot.

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Per Foot.

Per Foot.

Per Foot.

Per Foot.

Per Foot.

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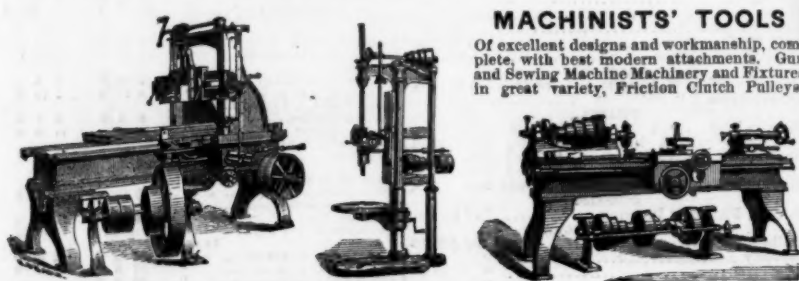
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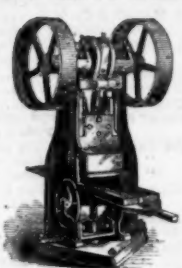
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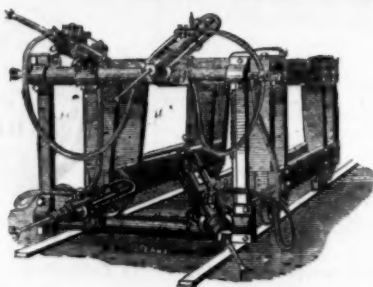
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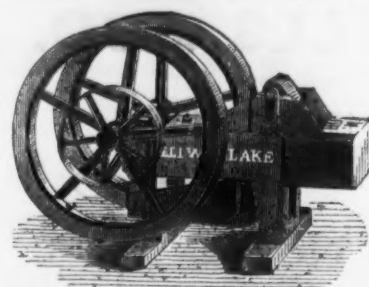
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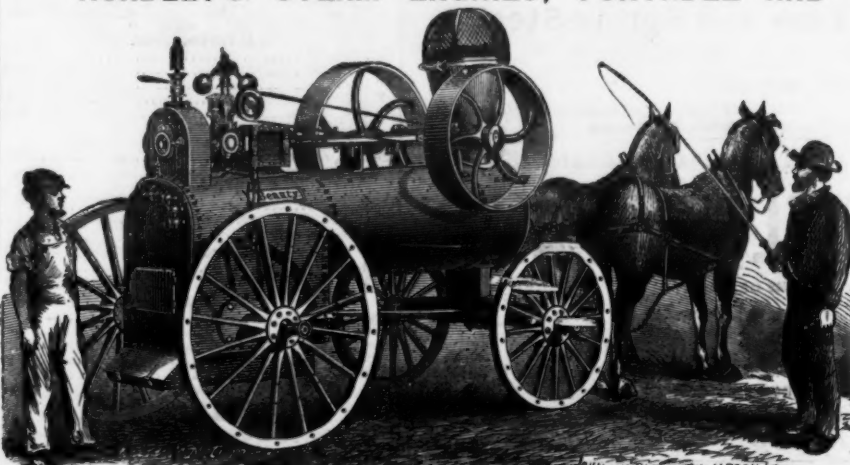
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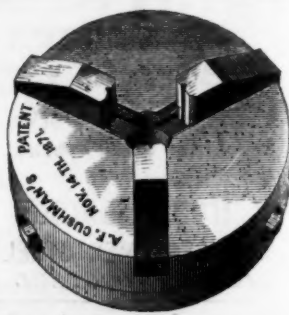
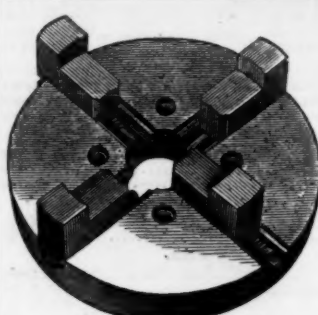
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